ALPHABETICAL INDEX

TO THE

SESSIONAL PAPERS

OF THE

PARLIAMENT OF CANADA

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LIST OF SESSIONAL PAPERS

Arranged in Numerical Order, with their titles at full length; the dates when Ordered and when Presented to the Houses of Parliament; the Names of the Senator or Member who moved for each Sessional Paper, and whether it is ordered to be Printed or not Printed.

CONTENTS OF VOLUME 1.

(This volume is bound in three parts.)

1. Report of the Auditor General for the year ended 31st March, 1916, Volume 1, Parts a b and A to K; Volume II, Parts L to U; Volume III, Parts V to Z; Volume IV, Part ZZ. Presented by Sir George Foster April 19, 1917.
· *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 2.

2. The Public Accounts of Canada, for the fiscal year ended March 31, 1916. Presented by Sir Thomas White, February 1, 1917...*Printed for distribution and sessional papers.*

3. Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1918, and in accordance with the provisions of "The British North America Act, 1867," the Governor General recommends these Estimates to the House of Commons. Presented by Sir Thomas White, January 31, 1917.
Printed for distribution and sessional papers.

4. Supplementary Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1917, and, in accordance with the provisions of "The British North America Act, 1867," the Governor General recommends these Estimates to the House of Commons. Presented by Sir Thomas White, February 5, 1917.
Printed for distribution and sessional papers.

5. Supplementary Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1918. Presented by Sir Thomas White, August 17, 1917.
Printed for distribution and sessional papers.

6. List of Shareholders in the Chartered Banks of the Dominion of Canada as on December 31, 1915. Presented by Sir Thomas White, January 25, 1917.. .. .. ..*Not printed.*

7. Report on certified cheques, drafts or bills of exchange, dividends remaining unpaid and unclaimed balances in Chartered Banks of the Dominion of Canada, for five years and upwards prior to December 31, 1915. Presented by Sir Thomas White, January 2[illegible], 1917.. .. ..*Not printed.*

CONTENTS OF VOLUME 3.

(This volume is bound in two parts.)

8. Report of the Superintendent of Insurance for the year 1916. Presented by Sir Thomas White, July 27, 1917.. .. ..*Printed for distribution and sessional papers.*

9. Abstract of Statements of Insurance Companies in Canada for the year ended December 31, 1916. Presented by Sir Thomas White, May 2, 1917.
Printed for distribution and sessional papers.

CONTENTS OF VOLUME 4.

10. Report of the Department of Trade and Commerce for the fiscal year ended 31st March, 1916: Part I.—Canadian Trade (Imports in and Exports from Canada). Presented by Sir George Foster, April 19, 1917.. ..*Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 5.

10*a*. Report of the Department of Trade and Commerce for the fiscal year ended March 31, 1916:—Part II.—Canadian Trade with France, Germany, the United Kingdom and the United States. Presented by Sir George Foster, January 25, 1917. *Printed for distribution and sessional papers.*

10*b*. Report of the Department of Trade and Commerce for the fiscal year ended March 31, 1916.—Part III.—Canadian Trade with British and Foreign Countries (except France, Germany, United Kingdom and United States). Presented by Sir George Foster, April 19, 1917... .. ..*Printed for distribution and sessional papers.*

10*c*. Report of the Department of Trade and Commerce for the fiscal year ended March 31, 1916 (Part IV, Miscellaneous Information). Presented by Sir George Foster, June 4, 1917.. .. ..*Printed for distribution and sessional papers.*

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10*d*. Report of the Department of Trade and Commerce, Part V—Grain Statistics, compiled by the Inspection Branch of the Department, Ottawa, for the fiscal year ended March 31, 1916, the crop year ended August 31, 1916, and the season of navigation ended December 14, 1916; and Report of the Board of Grain Commissioners. Presented by Sir George Foster, June 8, 1917.. .. *Printed for distribution and sessional papers.*

10*e*. Report of the Department of Trade and Commerce, for the fiscal year ending March 31, 1916 (Part VI.—Subsidized Steamship Services, with Statistics showing Steamship Traffic to December 31, 1916, and Estimates for fiscal year 1917-1918). Presented by Sir George Foster, May 3, 1917... ..*Printed for distribution and sessional papers.*

10*f*. Report of the Department of Trade and Commerce for the fiscal year ended March 31, 1916: Part VII—Trade of Foreign Countries, Treaties and Conventions. Presented by Sir George Foster, 1917.. .. ..*Printed for distribution and sessional papers.*

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11. Report of the Department of Customs for the year ended March 31, 1916. Presented by Hon. Mr. Reid, January 29, 1917.. ..*Printed for distribution and sessional papers.*

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12, 13, 14. Reports, Returns and Statistics of the Inland Revenues of the Dominion of Canada, for the fiscal year ended March 31, 1916. Part I.—Excise. Part II.—Weights and Measures, Gas and Electricity. Part III.—Adulteration of Food. Presented by Sir James Lougheed, January 26, 1917...*Printed for distribution and sessional papers.*

15. Report of the Minister of Agriculture for the Dominion of Canada, for the year ended March 31, 1916. Presented by Hon. Mr. Burrell, January 26, 1917. *Printed for distribution and sessional papers.*

15*a*. Report of the Dairy and Cold Storage Commissioner for the fiscal year ending March 31, 1916 (Dairying, Fruit, Extension of Markets and Cold Storage.) Presented by Hon. Mr. Burrell, 1917.. .. ..*Not printed.*

CONTENTS OF VOLUME 8—*Concluded.*

15*b*. Report of the Veterinary Director General for the year ending March 31, 1916. Presented by Hon. Mr. Burrell, 1917.. .. ..*Printed for distribution and sessional papers.*

15*c*. Report on "The Agricultural Instruction Act," 1915-16, pursuant to Section 8, Chapter 5 of 3-4 George V. Presented by Hon. Mr. Patenaude, January 31, 1917. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 9.

(This volume is bound in two parts.)

16. Report of the Director and Officers of the Experimental Farms for the year ending 31st March, 1916.—Volumes I, II and III. Presented by Sir George Foster, August 13, 1917. *Printed for distribution and sessional papers.*

17. Criminal Statistics for the year ended September, 1915. (Appendix to the Report of the Minister of Trade and Commerce for the year 1915.) Presented by Sir George Foster, 1917. .. ..*Printed for distribution and sessional papers.*

18. Return of By-elections for the House of Commons of Canada held during the year 1916. Presented by Hon. Mr. Speaker, 1917.. .. ..*Not printed.*

CONTENTS OF VOLUME 10.

19. Report of the Minister of Public Works on the works under his control for the fiscal year ended March 31, 1916. Presented by Hon. Mr. Rogers, January 26, 1917. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 11.

20. Annual Report of the Department of Railways and Canals, for the fiscal year from April 1, 1915, to March 31, 1916. Presented by Hon. Mr. Cochrane, April 19, 1917. *Printed for distribution and sessional papers.*

20*a*. Canal Statistics for the season of Navigation, 1916. Presented by Hon. Mr. Reid, May 7, 1917... .. ..*Printed for distribution and sessional papers.*

20*b*. Railway Statistics of the Dominion of Canada, for the year ended 30th June, 1916. Presented by Hon. Mr. Cochrane, April 24, 1917. *Printed for distribution and sessional papers.*

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20*c*. Eleventh Report of the Board of Railway Commissioners for Canada, for the year ending 31st March, 1916. Presented by Hon. Mr. Cochrane, January 23, 1917. *Printed for distribution and sessional papers.*

20*d*. Telephone Statistics of the Dominion of Canada, for the year ended June 30, 1916. Presented by Hon. Mr. Cochrane, April 19, 1917. *Printed for distribution and sessional papers.*

20*e*. Express Statistics of the Dominion of Canada, for the year ended June 30, 1916. Presented by Hon Mr. Cochrane, April 25, 1917. *Printed for distribution and sessional papers.*

20*f*. Telegraph Statistics of the Dominion of Canada, for the year ended June 30, 1916. Presented by Hon. Mr. Cochrane, April 19, 1917. *Printed for distribution and sessional papers.*

20*g*. Report of the Royal Commission appointed to consider the general problem of transportation in Canada, comprising:—Report of Sir H. F. Drayton and Mr. W. M. Acworth; Report of Mr. A. H. Smith; and, Appendices A and B, being Report of Appraisal of Canadian Northern Railway System and Grand Trunk Pacific Railway, by Mr. Geo. F. Swain, C.E. Presented by Sir Thomas White, May 2, 1917. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 13.

21. Forty-ninth Annual Report of the Department of Marine and Fisheries, for the year 1915-16—Marine. Presented by Hon. Mr. Hazen, January 23, 1917.
Printed for distribution and sessional papers.

22. List of Shipping issued by the Department of Marine and Fisheries, being a list of vessels on the Registry Books of the Dominion of Canada, on the 31st day of December, 1916. Presented by Hon. Mr. Hazen, September 4, 1917.
Printed for distribution and sessional papers.

23. Supplement to the Forty-ninth Annual Report of the Department of Marine and Fisheries for the fiscal year 1915-16. (Marine)—Steamboat Inspection Report. Presented by Hon. Mr. Hazen, April 19, 1917... ..*Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 14.

24. Report of the Postmaster General for the year ended 31st March, 1916. Presented by Hon. Mr. Blondin, February 1, 1917...*Printed for distribution and sessional papers.*

25. Annual Report of the Department of the Interior, for the fiscal year ending March 31, 1916. Presented by Hon. Mr. Roche, January 22, 1917.
Printed for distribution and sessional papers.

CONTENTS OF VOLUME 15.

25*b*. Annual Report of the Topographical Surveys Branch of the Department of Interior, 1915-16. Presented by Hon. Mr. Roche, June 19, 1917.
Printed for distribution and sessional papers.

25*c*. Report of Hydrometric Surveys (Stream Measurements), for the calendar year 1915. Presented by Hon. Mr. Roche, April 19, 1917.
Printed for distribution and sessional papers.

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25*d*. Fifteenth Report of the Geographic Board of Canada for year ended March 31, 1916. Presented, 1917.. .. ..*Not printed.*

25*e*. Report of the British Columbia Hydrometric Survey for the calendar year 1915 (Water Resources Paper No. 18 of the Dominion Water Power Branch, Department of the Interior). Presented by Hon. Mr. Roche, July 5, 1917.
Printed for distribution and sessional papers.

25*f*. Progress Report of the Manitoba Hydrometric Survey for the calendar year 1915 (Water Resources Paper No. 19 of the Dominion Water Power Branch, Department of the Interior). Presented by Hon. Mr. Roche, July 7, 1917.
Printed for distribution and sessional papers.

CONTENTS OF VOLUME 17.

26. Summary Report of the operations of the Geological Survey, Department of Mines, for the calendar year, 1916. Presented by Hon. Mr. Meighen, August 28, 1917.
Printed for distribution and sessional papers.

26*a*. Summary Report of the Mines Branch of the Department of Mines, for the calendar year ending 31st December, 1915. Presented by Hon. Mr. Patenaude, April 19, 1917.
Printed for distribution and sessional papers.

CONTENTS OF VOLUME 18.

27. Report of the Department of Indian Affairs for the year ended March 31, 1916. Presented by Hon. Mr. Roche, January 22, 1917.
Printed for distribution and sessional papers.

28. Report of the Royal Northwest Mounted Police, 1916. Presented by Sir Robert Borden, April 19, 1917.. .. ..*Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 19.

29. Report of the Secretary of State of Canada for the year ended March 31, 1916. Presented by Hon. Mr. Roche, August 18, 1917... ..*Printed for distribution and sessional papers.*

30. The Civil Service List of Canada for the year 1916. Presented 1917.
Printed for distribution and sessional papers.

31. Eighth Annual Report of the Civil Service Commission of Canada for the year ended August 31, 1916. Presented by Hon. Mr. Patenaude, April 19, 1917.
Printed for distribution and sessional papers.

32. Annual Report of the Department of Public Printing and Stationery for the fiscal year ended March 31, 1916. Presented by Sir Robert Borden, July 31, 1917.
Printed for distribution and sessional papers.

33. Report of the Secretary of State for External Affairs for the year ended March 31, 1917. Presented 1917... .. ..*Printed for distribution and sessional papers.*

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34. Report of the Minister of Justice as to the Penitentiaries of Canada for the fiscal year ending March 31, 1916. Presented 1917...*Printed for distribution and sessional papers.*

35. Report of the Militia Council for the Dominion of Canada, for the fiscal year ending March 31, 1916. Presented by Sir A. E. Kemp, February 3, 1917.
Printed for distribution and sessional papers.

36. Report of the Department of Labour for the fiscal year ending March 31, 1916. Presented by Hon. Mr. Crothers, January 22, 1917.
Printed for distribution and sessional papers.

36*a*. Ninth Report of the Registrar of Boards of Conciliation and Investigation of the proceedings under "The Industrial Disputes Investigation Act, 1907," for the fiscal year ending March 31, 1916. Presented by Hon. Mr. Crothers, January 22, 1917.
Printed for distribution and sessional papers.

37. Twelfth Annual Report of the Commissioners of the Transcontinental Railway, for the year ended March 31, 1916. Presented by Hon. Mr. Cochrane, April 19, 1917.
Printed for distribution and sessional papers.

CONTENTS OF VOLUME 21.

38. Report of the Department of the Naval Service, for the fiscal year ending March 31, 1916. Presented by Hon. Mr. Hazen, January 22, 1917.
Printed for distribution and sessional papers.

38*a*. Supplement to the Sixth Annual Report of the Department of Naval Service, Fisheries Branch,—Contributions to Canadian Biology, being studies from the biological stations of Canada, 1915-1916. Presented by Hon. Mr. Hazen, June 4, 1917.
Printed for distribution and sessional papers.

38*c*. Lobster Conservation in Canada, by A. P. Knight, M.A.
Printed for distribution and sessional papers.

39. Forty-ninth Annual Report of the Fisheries Branch of the Department of the Naval Service, 1915-16. Presented by Hon. Mr. Hazen, January 22, 1917.
Printed for distribution and sessional papers.

CONTENTS OF VOLUME 21—*Continued.*

40. The Report of the Joint Librarians of Parliament. Presented by Hon. Mr. Speaker. January 19, 1917... .. ..*Not printed.*

41. Copies of Orders in Council, as follows:—

P.C. 1917, dated the 15th day of July, 1916, respecting the appointment of a Parliamentary Under Secretary of State for External Affairs during the continuance of the war.

P.C. 2576, dated the 21st day of October, 1916, respecting the appointment of Hugh Clark, Member of the House of Commons for the Electoral District of North Bruce, to the position of Parliamentary Under Secretary for Exernal Affairs, during the continuance of the present war.

P.C. 1720, dated the 15th day of July, 1916, respecting the appointment of a Parliamentary Secretary of the Department of Militia and Defence, during the continuance of the present war.

P.C. 1730, dated the 19th day of July, 1916, respecting the appointment of Fleming Blanchard McCurdy, Member of the House of Commons for the Electoral District of Shelburne and Queens, to the position of Parliamentary Secretary of the Department of Militia and Defence, during the continuance of the present war.

P.C. 2651, dated the 28th day of October, 1916, respecting the establishment of a ministry in London charged with the administration of the overseas forces of Canada, and the direction and control of the expenditures abroad in connection therewith.

P.C. 2656, dated the 31st day of October, 1916, respecting the appointment of Honourable Sir George Halsey Perley, to the position of Minister of Overseas Military Forces from Canada in the United Kingdom. Presented by Sir Robert Borden, January 18, 1917.. .. ..*Printed for sessional papers only*

42. Papers relating to the Imperial War Conference, 1917. Presented by Sir Robert Borden, January 22, 1917.. .. ..*Printed for sessional papers only.*

42*a*. Copy of a Parliamentary Paper (Cd. 8566), containing extracts from the Minutes of the Proceedings of the Imperial War Conference, 1917, and Papers laid before the Conference. Presented by Sir Robert Borden, June 15, 1917.
Printed for distribution and sessional papers.

43. Copies of Orders in Council, as follows:—

P.C. 64-15-25, dated the 29th June, 1916, authorizing the superannuation of Mr. Silas Blair Kent, a clerk in Sub-division "B" of the First Division, employed as chief fishing bounty officer of the Naval Service Department.

P.C. 3192, dated 30th December, 1916, Regulations governing the payment of Separation Allowance in the Royal Canadian Navy and Royal Naval Canadian Volunteer Reserve.

P.C. 3108, dated 19th September, 1916, Regulations governing payment of "Command Money" to officers on "Special Service," etc., in the Royal Canadian Navy.

P.C. 2942, dated 29th November, 1916, Regulations governing payment of "Hard-lying Money" in the Royal Canadian Navy.

P.C. 2142, dated 11th October, 1916, Amendment to Order in Council P.C. 1334, dated 3rd June, 1916, establishing Rates of Pensions for the Military and Naval Forces of Canada.

P.C. 2130, dated 9th September, 1916, Regulations for enrolment of men in the Royal Canadian Volunteer Reserve for service in the Royal Navy.

P.C. 1939, dated 18th August, 1916, Order made under War Measures Act, 1914, to reduce risk of persons of enemy nationality landing in Canada under guise of neutrals. Presented by Hon. Mr. Hazen, January 22, 1917... .. ..*Not printed.*

43*a*. Copy of extract from Order in Council No. P.C. 942, dated 5th April, 1917, with reference to Regulations governing the Payment of Separation Allowance in the Royal Canadian Navy. Presented by Hon. Mr. Hazen, June 11, 1917.. .. ..*Not printed.*

43*b*. Copy of extract from Order in Council No. P.C. 1397, dated 21st May, 1917: Rules and Regulations to apply to persons who are employed in or who are in or in the vicinity of any store, wharf, etc., in or upon which any ammunition, etc., is handled. Presented by Hon. Mr. Hazen, June 14, 1917... .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

43*c*. Copy of Extract from Order in Council No. P.C. 1576, dated 11th June, 1917: Regulations instituting the rank of Chief Skipper and Skipper in the Royal Canadian Navy. Presented by Hon. Mr. Hazen, June 20, 1917.. .. ..*Not printed.*

43*d*. Copy of Order in Council, P.C. 69/1774, dated 28th June, 1917, containing Regulations for the Payment of Specialist Allowance to R.N.C.V.R. and R.N.C.V.R. Overseas Division. Presented by Hon. Mr. Hazen, July 9, 1917.. .. ..*Not printed.*

43*e*. Copy Extract from Order in Council, P.C. No. 1783, dated 29th June, 1917:—Rules and Regulations governing the issue of Pay, Allowances and Pensions, Department of the Naval Service—Copy Extract from Order in Council, P.C. No. 1871, dated 6th July, 1917; —Amendment to the Regulations for the payment of Separation Allowance to the dependents of those on Active Service under the Naval Service Department. Presented by Sir James Lougheed, July 12, 1917. (Senate)... .. ..*Not printed.*

43*f*. Extract from Order in Council, P.C. 1993 of the 17th July, 1917: Scale of Subsistence Allowances to Officers and men of the Naval Service when travelling on duty.—And also,—Extract from Order in Council, P.C. 1994 of the 17th July, 1917: Scale of Allowances in lieu of lodging, provisions, fuel and light, for Officers and men of the Naval Service. Presented by Hon. Mr. Hazen, August 6, 1917.. .. ..*Not printed.*

43*g*. Extract from Order in Council, P.C. 2105, dated 9th August, 1917: Amendments to regulations for the issue of pay, allowances and pensions to officers, warrant officers and men invalided, etc., from the Naval Service. Presented by Hon. Mr. Hazen, August 27, 1917... .. ..*Not printed.*

43*h*. Extract from Order in Council ("Defence of Canada Order"), P.C. No. 2277, dated the 17th August, 1917:—Amendments respecting Naval Service. The Senate..*Not printed.*

43*i*. Extract from Order in Council, No. P.C. 2433, dated 1st September, 1917:—Regulations *re* Pay and Allowances to Officers and Men after discharge from the Canadian Naval Service. The Senate.. .. ..*Not printed.*

44. Correspondence relating to the withdrawal of the Ross Rifle from the Canadian Army Corps. Presented by Sir Robert Borden, January 22, 1917.
Printed for sessional papers only.

45. Report of the War Purchasing Commission, covering period from its appointment on May 8, 1915, to December 31, 1916. Presented by Hon. Mr. Kemp, January 23, 1917.
Not printed.

46. Copies of Orders in Council respecting the establishment of a National Service Board of Canada, and appointments thereto, under the provisions of the War Measures Act, 1914. Presented by Sir Robert Borden, January 23, 1917.
Printed for sessional papers only.

47. Copy of Agreement between His Majesty the King and The Acadia Coal Company, Ltd., concerning the lease of the Vale Railway. Presented by Hon. Mr. Cochrane, January 23, 1917... .. ..*Not printed.*

48. Copy of Agreement between His Majesty the King and The Quebec and Saguenay Railway Co., The Quebec Railway Light, and Power Co. The Lotbinière and Megantic Railway Co., and The Quebec Railway Light Heat and Power Co., respecting the acquisition by the Government of the said railways. Presented by Hon. Mr. Cochrane, January 23, 1917.. .. ..*Not printed*

48*a*. Return to an Order of the House, of the 23rd April, 1917, for a copy of all proceedings in the Exchequer Court of Canada, and judgment of Mr. Justice Cassels concerning the reference of the Quebec and Saguenay Railway, the Quebec and Montmorency Railway and the Lotbinière and Megantic Railway. Presented June 21, 1917. Mr. Lemieux.
Not printed

CONTENTS OF VOLUME 21—*Continued.*

48b. Return to an Order of the House, of the 14th May, 1917, for a copy of the judgment delivered by Mr. Justice Cassels on the 24th day of January, 1917, in the matter of fixing the price to be paid by the Government for the Quebec, Montmorency and Charlevoix Railway, the Quebec and Saguenay Railway, and the Lotbinière and Megantic Railway, under the statute of last session, Chapter 22, 6-7 George V. Presented June 27, 1917. Mr. Graham.. .. ..*Not printed.*

49. Statement of Governor General's Warrants issued since the last Session of Parliament on account of 1916-17. Presented by Sir Thomas White, January 25, 1917. *Not printed.*

49a. Statement of Governor General's Warrants issued since the adjournment of Parliament on February 7, 1917. Presented by Sir Thomas White, April 24, 1917..*Not Printed.*

50. Copy of Amendments to the Radiotelegraph Regulations since the 1st August, 1914. Presented by Hon. Mr. Hazen, January 25, 1917... .. ..*Not printed.*

50a. Copy of Amendment to subsection (*d*) of section 104 of the Radiotelegraph Regulations; Operation of ship stations within a Canadian harbour. Presented by Hon. Mr. Hazen, January 29, 1917.. .. .. *Not printed.*

50b. Copy of Amendment to Radiotelegraph Regulations issued by the Minister of the Naval Service, under Section 11, Chapter 43, of the Radiotelegraph Act, 3-4 George V. Presented by Hon. Mr. Hazen, April 19, 1917.. .. ..*Not printed.*

51. Statement of Expenditure on account of "Miscellaneous Unforeseen Expenses," from the 1st April, 1916, to the 18th January, 1917, in accordance with the Appropriation Act of 1916. Presented by Sir Thomas White, January 25, 1917... .. ..*Not printed.*

52. Statement of Temporary Loans issued since April 1, 1916, to 18th January, 1917. Presented by Sir Thomas White, January 25, 1917... .. ..*Not printed.*

53. Report and Statement of Receipts and Expenditures of the Ottawa Improvement Commission to March 31, 1916. Presented by Sir Thomas White, January 25, 1917. *Not printed.*

54. Statement of the Receipts and Expenditures of the Royal Society of Canada, for the year ended April 30, 1916. Presented by Sir Thomas White, January 25, 1917...*Not printed.*

55. Statement of Receipts and Expenditures of the National Battlefields Commission to 31st March, 1916. Presented by Sir Thomas White, January 25, 1917.. ..*Not printed.*

56. Statement of Superannuation and Retiring Allowances in the Civil Service during the year ending 31st December, 1916, showing name, rank, salary, service allowance and cause of retirement of each person superannuated or retired, also whether vacancy has been filled by promotion, or by appointment, and the salary of any new appointee. Presented by Sir Thomas White, January 25, 1917... .. ..*Not printed.*

57. Statement in pursuance of Section 17 of the Civil Service Insurance Act, for the year ending March 31, 1916. Presented by Sir Thomas White, January 25, 1917. *Not printed.*

58. Regulations under "The Destructive Insect and Pest Act," pursuant to Section 9, Chapter 31 of 9-10 Edward VII. Presented by Hon. Mr. Burrell, January 26, 1917. *Not printed.*

59. Account of the average number of men employed on the Dominion Police Force during each month of the year 1916, and of their pay and travelling expenses, pursuant to Chapter 92, Section 6, Subsection 2, of the Revised Statutes of Canada. Presented by Hon. Mr. Doherty, January 26, 1917... .. ..*Not printed.*

60. Copy of the evidence taken before the Hon. Sir Charles Davidson, Kt., Commissioner appointed to inquire into the purchase by and on behalf of the Government of the Dominion of Canada, of Arms, Munitions, Implements, Materials, Horses, Supplies, and other things for the purpose of the present war, and as to the expenditures and payments made or agreed to be made therefor; together with the Report of the said Commissioner concerning the sale of Small Arms Ammunition; purchase of Submarines, and Military Cloth (Auburn Woollen Mills Co.). Presented by Hon. Mr. Meighen, January 30, 1917.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

61. Report submitted by the officer in charge of the Canadian Records Office, London, Eng., to The Right Honourable Sir Robert Borden, G.C.M.G., M.P., Prime Minister of Canada, on the work of the Canadian War Records Office since the date of its foundation to the 11th January, 1917. Presented by Sir Robert Borden, January 31, 1917. *Not printed.*

62. Annual Return respecting Trade Unions under Chapter 125, R.S.C., 1906. Presented by Hon. Mr. Patenaude, January 31, 1917.. .. ..*Not printed.*

63. A detailed statement of all bonds or securities registered in the Department of the Secretary of State of Canada, since last return (22nd January, 1916) submitted to the Parliament of Canada under Section 32 of Chapter 19, of the Revised Statutes of Canada, 1906. Presented by Hon. Mr. Blondin, January 31, 1917... ..*Not printed.*

64. Return of Orders in Council which have been published in the *Canada Gazette*, between the 1st January, 1916, and the 31st December, 1916, in accordance with the provisions of Section 5 of "The Dominion Lands Survey Act," Chapter 21, 7-8 Edward VII. Presented by Hon. Mr. Roche, February 1, 1917.. .. ..*Not printed.*

65. Return of Orders in Council which have been published in the *Canada Gazette*, between 1st January, 1916, and the 31st December, 1916, in accordance with the provisions of "The Forest Reserves and Park Act," Section 19, of Chapter 10, 1-2 George V. Presented by Hon. Mr. Roche, February 1, 1917.. .. ..*Not printed.*

66. Return of Orders in Council which have been published in the *Canada Gazette*, between the 1st January, 1916, and the 31st December, 1916, in accordance with the provisions of Chapter 47, 2 George V, entitled "The Railway Belt Water Act." Presented by Hon. Mr. Roche, February 1, 1917... .. ..*Not printed.*

67. Return of Orders in Council which have been published in the *Canada Gazette* and in the British Columbia *Gazette*, between 1st January, 1916, and the 31st December, 1916, in accordance with provisions of Subsection (*d*) of Section 38 of the regulations for the survey, administration, disposal and management of Dominion Lands within the 40-mile Railway Belt in the Province of British Columbia. Presented by Hon. Mr. Roche, February 1, 1917.. .. ..*Not printed.*

68. Return showing all lands sold by the Canadian Pacific Railway Company during the year, from the 1st October, 1915, to 30th September, 1916, together with the names of the purchasers, in accordance with the Statutes of Canada, 1886, Chapter 9, Section 8. Presented by Hon. Mr. Roche, February 1, 1917.. .. ..*Not printed.*

69. Return of Orders in Council which have been published in the *Canada Gazette*, between 1st January, 1916, and the 31st December, 1916, in accordance with the provisions of Section 77 of "The Dominion Lands Act," Chapter 20, 7-8 Edward VII. Presented by Hon. Mr. Roche, February 1, 1917.. .. ..*Not printed.*

70. Certified copies of Reports of the Committee of the Privy Council, approved by His Excellency the Governor General on the 29th November, 1916, giving authority for the cancellation on and from the 1st January, 1917, of the agreements between the Government of Canada and the Governments of Manitoba, Saskatchewan and Alberta, respectively, respecting the services of the Royal North West Mounted Police in those provinces. Presented by Sir Robert Borden, February 1, 1917. *Printed for sessional papers only*

70*a*. Return to an Address to His Excellency the Governor General, of the 31st January, 1917, for a copy of all documents, letters, messages, correspondence, etc, respecting the termination of the agreements between the Government of Canada and the Governments of the Provinces of Saskatchewan and Alberta in reference to the Royal North West Mounted Police. Presented June 1, 1917. Mr. McCraney.. .. . *Not printed.*

71. Return to an Order of the House, of the 20th March, 1916, for a copy of all telegrams, letters and correspondence concerning the appointment of Mr. Alfred Gravel, Harbour Commissioner of Quebec, and concerning all other candidates for the position of Commissioner on the Harbour Board of Quebec, to represent the South Shore. Presented February 2, 1917. Mr. Bourassa... .. .. *Not printed.*

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72. Return to an Address to His Royal Highness the Governor General, of the 2nd February, 1914, for a copy of all Orders in Council, correspondence, petitions, telegrams and other papers or documents bearing date between the years 1885 and 1914 in any way relating to the prohibition of the export of Sockeye Salmon from the Province of British Columbia. Presented February 2, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

73. Seventh Annual Report of the Commission of Conservation for the fiscal year ending March 31, 1916. Presented by Hon. Mr. Hazen, February 5, 1917.. .. ..*Not printed.*

74. Copy of correspondence between Sir Robert Borden and Sir Wilfrid Laurier respecting proposals for the extension of the term of Parliament, November 3, 1915, to January 3, 1917. Presented by Sir Robert Borden, May 23, 1917.
Printed for sessional papers only.

75. Detailed Statement of Customs Duties and the Refund thereof, under Section 92, Consolidated Revenue Act, for the year ended March 31, 1916. (Senate)... ..*Not printed.*

75*a*. Detailed Statement of all Remissions and Refunds of the Tolls or duties for the fiscal year ending March 31, 1916.—Also,—Supplementary statement of the Remissions and Refunds of Tolls and Duties from the Department of Marine and Fisheries. Presented by Hon. Mr. Patenaude, April 19, 1917.. .. .. *Not printed.*

76. Ordinances of the Yukon Territory, passed by the Yukon Council in 1916. (Senate).
Not printed.

76*a*. Return of Orders in Council passed under the provisions of Section 18, of Chapter 63, Revised Statutes of Canada, "An Act to provide for the Government of the Yukon Territory." Presented by Hon. Mr. Patenaude, April 19, 1917.. .. ..*Not printed.*

76*b* Return of Orders in Council passed in the year 1917, under the provisions of Section 18, of Chapter 63, Revised Statutes of Canada, "An Act to provide for the Government of the Yukon Territory." Presented by Hon. Mr. Sevigny, July 5, 1917.
Not printed.

77. Copy of extract from Order in Council No. P.C. 43 263, dated 27th January, 1917, authorizing Regulations governing the payment of Allowance for the Accountant Officers in the Royal Canadian Navy of Receiving Ships and Depot Ships, in accordance with the provisions of Secton 47, Chapter 43, 9-10 Edward VII. Presented by Hon. Mr. Hazen, February 6, 1917.. .. ..*Not printed.*

78. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence respecting the appointment of a Commission to investigate the financial and economic condition of Canadian railways, showing the names of the Commissioners, the rate of their remuneration, along with the names of the secretaries and engineers appointed by them, or by the Commission, and the rate of their remuneration. Presented February 6, 1917.—*Sir Wilfrid Laurier*.. .. ..*Not printed.*

79. Return to an Order of the House of the 31st January, 1917, for a copy of all papers, letters, telegrams and other documents relative to the removal of Mr. H. D. McKenzie as mechanical foreman at Stellarton on the Canadian Government Railways, and the appointment of his successor. Presented February 6, 1917.—*Mr. Macdonald.*
Not printed.

80. Return to an Order of the House of the 31st January, 1917, for a return showing the quantity of freight carried over the Grand Trunk Pacific Railway between Lévis and Moncton since that portion of said railway has been operated by the Canadian Government Railways System. Presented February 6, 1917.—*Mr. Copp*.. .. ..*Not printed.*

81. Return to an Order of the House of the 12th April, 1916, for a Return showing:—1. How many clerks there are in the Interior Department who belong to and are paid from the outside service vote and who work in the inside service? 2. The names of said clerks? 3. Salary paid to each? 4. How long each has been in the service of the Department? 5. If all or any of these clerks have passed any examination. If so, what examination and on what date or dates? Presented February 6, 1917.—*Mr. Turriff*.. ..*Not printed*

CONTENTS OF VOLUME 21—*Continued.*

82. Return to an Order of the House of the 15th March, 1916, for a copy of all correspondence between the Government and the Provinces, regarding increased co-operation in the promotion of immigration and land settlement, commencing with a letter of the Minister of the Interior to the Provincial Prime Ministers, in November, 1911. Presented February 6, 1917.—*Sir Wilfrid Laurier*... .. ..*Not printed.*

83. Return to an Order of the House of the 27th March, 1916, for a Return showing:—1. The names and salaries of the persons employed in the Immigration Service in the City of Montreal; their respective salaries when appointed and what they receive at the present time? 2. Which of such employees are given travelling or other expenses, and how much has been been paid to each on that account since their respective appointments. Presented February 6, 1917.—*Mr. Lachance*.. .. ..*Not printed.*

84. Return to an Order of the House of the 31st January, 1917, for a return showing the quantities of timber cut, and the sum paid therefor, to date, under the lease or sale of timber made by the Indian Department to Mr. Arthur Webber from lands situated near Ship Harbour Lake, Halifax County, together with the name or names of all surveyors of the timber cut from the said Indian lands under the above-mentioned sale or lease, and copies of all reports made in connection therewith by said surveyors. Presented February 6, 1917.—*Mr. McLean (Halifax)*... .. ..*Not printed.*

85. A copy of the Special Report made by the Royal Commission on Indian Affairs on the Kitsilano Indian Reserve, together with the Order in Council passed on the 28th March, 1916, and all other papers and correspondence relating to the Report. (Senate). *Not printed.*

86. Return to an Address to His Excellency the Governor General, of the 31st January, 1917, for a copy of all correspondence exchanged between the Dominion Government and the Provincial Governments inviting them to a conference on the subject of making provisions for returned soldiers, including a copy of the proceedings of the conference which took place on the 10th of January at Ottawa on the same subject. Presented February 7, 1917.—*Sir Wilfrid Laurier* .. ..*Printed for sessional papers only.*

87. Return to an Order of the House, of the 31st January, 1917, for a copy of all correspondence between any Member of the Government and Sir Thomas Tait referring to his appointment to, and resignation from, the National Service Board. Presented February 7, 1917.—*Mr. Graham*.. .. ..*Printed for sessional papers only.*

87*a*. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence between Mr. Murray, Secretary of the Manufacturers' Association, and any Member of the Government, or Sir Thomas Tait, as head of the National Service Board, concerning his suggested appointment as Secretary of the National Service Board. Presented June 1, 1917.—*Mr. Graham*.. .. ..*Not printed*

88. Correspondence between the Prime Minister and the Leader of the Opposition concerning the formation of a Parliamentary National Service Commission. Presented by Sir Robert Borden, February 7, 1917... .. ..*Printed for sessional papers only.*

89. Return to an Order of the House, of the 5th February, 1917, for a copy of all petitions, letters, telegrams, reports and other documents relative to the closing of the Canard and Splitlog Post Office and the opening of Loiselleville Post Office, in the County of Essex, together with a copy of all petitions and documents relative to the establishment of rural mail routes from the Loiselleville Post Office. Presented February 7, 1917.—*Mr. Wilcox*.. .. ..*Not printed.*

90. Report on the Canadian Army Medical Service, by Colonel Herbert A. Bruce, Special Inspector General, Medical Services, Canadian Expeditionary Force, dated at London, England, 20th September, 1916. Presented by Sir Robert Borden, February 7, 1917 *Not printed*

90*a*. Report on the Canadian Army Medical Service, by a Board of Officers, presided over by Surgeon-General Sir William Babtie, K.C.M.G., C.B., V.C., dated at London, England December 22, 1916. Presented by Sir Robert Borden, February 7, 1917..*Not printed*

CONTENTS OF VOLUME 21—*Continued.*

90*b*. Copy of Interim Report of the Surgeon-General G. C. Jones, Director Medical Services. Canadians, in reply to the Report on the Canadian Army Medical Service by Colonel Herbert A. Bruce, Special Inspector-General, Medical Services, Canadian Expeditionary Force, dated London, September 28, 1916. Presented by Sir Edward Kemp, May 31, 1917.. .. ..*Not printed.*

91. Return to an Order of the House, of the 7th February, 1917, for a copy of all letters, telegrams, papers and other documents relative to the closing of the Marine Agency at Pictou last autumn, and as to the re-opening of said agency. Presented April 19, 1917. —*Mr. Macdonald*.. .. ..*Not printed.*

92. Return to an Order of the House of the 5th February, 1917, for a Return showing:—1. The number of horses that have been bought in Canada for war purposes in each of the years 1914, 1915 and 1916, resepctively, (*a*) for the Canadian Army; (*b*) for Britain; and (*c*) for France and our other Allies. 2. The amount paid for the horses in each of the years for the different countries mentioned. Presented April 19, 1917.—*Mr. Edwards*.. .. ..*Not printed.*

93. Return to an Order of the House of the 31st January, 1917, for a Return showing:—1. The names, home addresses and former occupations of all censors, decoders or other employees of the Government in the different cable stations in Nova Scotia during the calendar year 1916. 2. The name of the person who recommended each of the said censors, decoders or employees. 3. What salary was paid to each of said persons for the calendar year 1916. Presented April 19, 1917.—*Mr. Sinclair*.. ..*Not printed.*

94. Copies of General Orders promulgated to the Militia for the period between December 30, 1915, and February 8, 1917. Presented by Sir Edward Kemp, April 19, 1917. *Not printed.*

95. Return to an Order of the House of the 11th March, 1915, for a copy of all charges, correspondence, letters, telegrams and other documents relative to the dismissal of Frank Dunlop, of Graves Point, at Sydney Mines, in the riding of North Cape Breton and Victoria, N.S., and the expenses of such investigation in detail. Presented April 19, 1917.—*Mr. McKenzie*.. .. ..*Not printed.*

96. Return to an Order of the House of the 3rd April, 1916, for a Return showing:—1. The names of the staff in the office of the High Commissioner for Canada in London? 2. Whether any of these officials are natives of Canada. If so which ones? 3. Whether it is true, as alleged, that Canada is the only British Dominion which employs none of its natives in its High Commissioner's Office. Presented April 19, 1917.—*Mr. Proulx*. *Not printed.*

97. Return to an Address to His Royal Highness the Governor General, of the 22nd February, 1915, for a copy of all Orders in Council, memoranda, correspondence or other documents in the possession of the Government, or any Department thereof, relating to the trade in dried fish and wines between Portugal and Canada. Presented April 19, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

98. Return to an Order of the House of the 31st January, 1917, for a tabulated statement showing the number of divorces granted by the Parliament of Canada since 1867. Presented April 19, 1917.—*Mr. Lemieux*.. .. ..*Not printed.*

99. Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams and other documents, including tenders, relating to the mail contract from Tatamagouche to New Annan and Tatamagouche Mountain, in the County of Colchester. Presented April 19, 1917.—*Mr. Macdonald*.. .. ..*Not printed.*

100. Copy of new Rule in substitution of Rule 236 of the General Rules and Orders now in force regulating the practice and procedure in the Exchequer Court of Canada, made on the 16th day of February, 1917. Presented by Hon. Mr. Patenaude, April 19, 1917. *Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

100a. Copy of Rule 200 of the General Rules and Orders now in force regulating the practice and procedure in the Exchequer Court of Canada; also, Copy of General Order respecting fees and costs in the Exchequer Court in the exercise of its jurisdicton as a Court of Admiralty. Presented by Hon. Mr. Patenaude, May 3, 1917.....*Not printed.*

101. Return to an Order of the House of the 5th February, 1917, for a return showing a list of all persons employed during the year 1916 in the round-house of the Canadian Government Railways at Pirate Harbour, N.S., as brakemen, telegraphers, cleaners and labourers, showing the dates of their appointments and length of time employed respectively, and also the monthly rate of wages paid to each of said employees. Presented April 19, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

102. Return to an Order of the House of the 31st January, 1917, for a copy of all letters, papers, telegrams and other documents relative to the application for, and the granting of, a Conciliation Board to the employees of the Acadia Coal Company in the spring of 1916, the proceedings of said Board, and all other papers in relation to the same. Presented April 19, 1917.—*Mr. Macdonald*.. .. ..*Not printed.*

103. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, telegrams and documents of all kinds exchanged between any person or persons and the Department of Labour or any other Department of the Government relating to the labour trouble at Thetford Mines, P.Q., and also copies of all correspondence exchanged between the different Departments of the Government respecting the same question. Presented April 19, 1917.—*Mr. Verville*.. .. ..*Not printed.*

104. Return to an Order of the House of the 31st January, 1917, for a copy of all letters, papers, telegrams and other documents relative to the application for, and the refusal to grant a Conciliation Board as petitioned for under the Industrial Disputes Investigation Act by the employees of the Canadian Government Railway at Pictou, who were members of the Longshoremen's Union at Pictou during the year 1916. Presented April 19, 1917.—*Mr. Macdonald*.. .. ..*Not printed.*

105. Return to an Order of the House of the 7th February, 1917, for a copy of the contract between the Government and the P. Lyall & Sons Construction Company for the reconstruction of the Parliament Building. Presented April 20, 1917.—*Mr. Murphy.*
Printed for Sessional Papers only.

106. Copy of Order in Council P.C. 1062, dated 16th April, 1917, ordering that wheat, wheat flour and semolina be transferred to the list of goods which may be imported into Canada free of duty of customs. Presented by Sir Thomas White, April 20, 1917.
Printed for Sessional Papers only.

107. Return to an Order of the House of the 19th April, 1917, for a return showing:—1. Whether the Government is aware as to whether there are cases in the Military Service in which men after enlistment have been given leave on harvesting furlough, and during such leave have been injured by accident, and who have in consequence of such accident incurred hospital bills, and who having been treated in hospital have returned to military duty and been discharged on account of injuries so received. 2. If so, whether claims have been made for hospital care and treatment. 3. If such claims have been recognized by the Government. 4. If not, why not. 5. If so, what action has been taken in connection therewith. 6. Whether in such cases the enlisted person is not entitled to pay up to time of discharge, and also the payment of his hospital account. Presented April 20, 1917.—*Mr. MacNutt*.. .. ..*Not printed.*

108. Copy of a communication from the Deputy Minister of Militia and Defence, relative to the total value of the Oliver equipment, so-called, supplied the Canadian soldiers who have crossed to England since the commencement of the present war. Presented by Sir Edward Kemp, April 20, 1917.. .. ..*Not printed.*

109. Return to an Order of the House of the 19th April, 1917, for a return showing:—1. The names of the Members of Parliament who now belong, or who did belong to the Overseas

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Forces or the Militia Forces of Canada since the present war was declared. 2. Whether these Members or any of them were, or are in receipt of pay from the Militia Department and in receipt of their indemnity as Members at the same time. 3. Whether the wives of these Members, or any of them were, or are in receipt of separation allowance. Presented April 20, 1917.—*Mr. Hughes (Kings, P.E.I.)*.. .. ..*Not printed.*

109*a*. Supplementary return to an Order of the House of the 19th April, 1917, for a return showing:—1. The names of the Members of Parliament who now belong, or who did belong to the Overseas Forces or the Militia Forces of Canada since the present war was declared. 2. Whether these Members, or any of them were, or are in receipt of pay from the Militia Department and in receipt of their indemnity as Members at the same time. 3. Whether the wives of these Members, or any of them were, or are in receipt of separation allowance. Presented April 24, 1917.—*Mr. Hughes (Kings, P.E.I.)*.. ..*Not printed.*

109*b*. Return to an Order of the House of the 25th April, 1917, for a return showing:—1. How many Members of the House of Commons are serving or have served in the Canadian Army. 2. The names of each of said Members, the date of appointment, and rank. 3. The names of those Members who have resigned or have withdrawn from military service and the date of withdrawal or resignation. 4. How much has been paid to each for military salary, expenses and separation allowance to wife or relatives, respectively. Presented May 31, 1917.—*Mr. Turriff*.. .. ..*Not printed.*

109*c*. Corrected copy of a return to an Order of the House of the 25th April, 1917, for a return showing:—1. How many Members of the House of Commons are serving or have served in the Canadian Army. 2. The names of each of said Members, the date of appointment, and rank. 3. The names of those Members who have resigned or have withdrawn from military service and the date of withdrawal or resignation. 4. How much has been paid to each for military service, expenses and separation allowance to wife or relatives, respectively. Presented June 14, 1917.—*Mr. Turriff*.. .. ..*Not printed.*

110. Return to an Order of the House of the 19th April, 1917, for a return showing:—1. What amounts have been given to the Canadian Patriotic Fund to December 31, 1916, and what amounts have been promised for 1917, by the different counties, towns and cities in each of the different provinces. 2. The names of the different counties, towns and cities, and the respective amounts subscribed and promised by each. 3. What counties, cities and towns in each province, if any, have not contributed any amount to the said fund up to the present time. Presented April 24, 1917.—*Mr. Edwards*.. ..*Not printed.*

110*a*. Return to an Order of the House of the 19th April, 1917, for a return showing:—1. How much money has been subscribed and voted to the Canadian Patriotic Fund by each of the different provinces to December 31, 1916. 2. How much money has been paid to the Canadian Patriotic Fund by each of the different provinces during the same time. 3. How much money has been promised by county, township, city or other grants by each province for the year 1917. 4. How many persons in each province have received assistance from the Canadian Patriotic Fund to December 31, 1916. 5. The total amount so expended in each province. Presented April 24, 1917.—*Mr. Edwards*.. ..*Not printed.*

111. Copy of Order in Council P.C. 802, dated 23rd March, 1917, in respect to taking over of the Ross Rifle Factory by the Government of Canada. Presented by Sir Edward Kemp, April 24, 1917.. .. ..*Not printed.*

112. Return to an Order of the House of the 31st January, 1917, for a copy of all documents, letters, telegrams and other correspondence in the Department of the Interior, relating to grazing leases numbers 2785, 2803, 2843, 3701, 3998, 4603, 5566, 6220 and 6221. Presented April 25, 1917.—*Mr. Steele*.. .. ..*Not printed.*

113. Memorandum from the Superintendent of Immigration respecting the advertising by the Canadian Government in United States newspapers for farm hands to work in Canada; together with a copy of the advertisements and instructions concerning the same. Presented by Hon. Mr. Roche, April 25, 1917.. .. ..*Not printed.*

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114. Copies of Orders in Council:—

P.C. 341, dated the 7th day of February, 1917, respecting the exportation of newsprint paper in sheets or rolls by license only under regulations by the Minister of Customs.

P.C. 445, dated the 17th day of February, 1917, containing orders and regulations respecting the price, sale, control, distribution, transport, etc., of newsprint paper in sheets or rolls.

P.C. 1059, dated the 16th day of April, 1917, empowering the Minister of Customs to fix the quantity and price of newsprint paper furnished or to be furnished to the publishers in Canada by the manufacturers; and controlling the distribution and delivery of the same.

P.C. 1060, dated the 16th day of April, appointing R. A. Pringle a commissioner to conduct an inquiry into and concerning the manufacture, sale, price and supply of newsprint paper within the Dominion of Canada. Presented by Sir Thomas White, April 26, 1917.. .. ..*Not printed.*

115. P.C. 3412, dated the 19th day of December, 1917, concerning the appointment of Mr. S. A. Armstrong as Director of the Military Hospitals Commission. Presented by Sir Thomas White, April 26, 1917.. .. ..*Not printed.*

116. Return to an Order of the House of the 3rd February, 1917, for a return showing the names and post office addresses of all purchasers of fish scrap from the reduction works at Canso in 1916, showing the price paid by each of said purchasers. Presented April 26, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

117. Return to an address to His Excellency the Governor General of the 23rd April, 1917, for a copy of the Order in Council increasing the toll rates on Victoria bridge. Montreal, and also a copy of all petitions, telegrams, letters and other documents referring to said increase. Presented April 30, 1917.—*Mr. Lemieux*.. .. ..*Not printed.*

118. Return to an Order of the House of the 23rd April, 1917, for a copy of all letters, telegrams, petitions and all other papers concerning the substitution of the name of Luceville given to the Intercolonial Railway Station of Ste. Luce, County of Rimouski, Quebec. Presented April 30, 1917.—*Mr. Lemieux*.. .. ..*Not printed.*

119. Return to an Order of the House of the 31st January, 1917, for a copy of all vouchers, correspondence, etc., in connection with the repairs to Beaver Harbour Wharf, Halifax County, within the last four years. Presented April 30, 1917.—*Mr. McLean (Halifax).* *Not printed.*

120. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, vouchers, etc., in connection with the repairs to Harrigan Cove Wharf, Halifax County, in 1914-15, under the foremanship of James McDonald. Presented April 30, 1917.—*Mr. McLean (Halifax)*.. .. ..*Not printed.*

121. Supplementary return to an Order of the House of the 16th February, 1916, for a return showing:—1. The amounts expended in Railway Subsidies in Canada during the years 1912, 1913, 1914 and 1915. 2. The amounts by provinces, and the names of the lines to which granted. 3. Amounts expended on the construction of Government-owned railways in Canada during the above years. 4. The amount expended in each province, and the name of the line of railway on which such expenditure was made. 5. Amounts expended on harbour and river improvements in Canada during the above years. 6. The amounts by provinces and the particular places where expended 7. Amounts expended on the building of public wharves, public breakwaters, and public dredging in North Cape Breton and Victoria during the years 1905 to 1911, inclusive, including the expenditure on Government railways. 8. Amounts expended for like purposes in the said county, during the years 1912, 1913, 1914 and 1915. Presented April 30, 1917.—*Mr. McKenzie*.. .. ..*Not printed.*

122. Return to an Order of the House of the 19th April, 1916, for a copy of all letters, petitions, correspondence and telegrams exchanged between the Government, its district engineer,

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and all other persons, concerning either the construction or repairing or purchase of the wharves at the following places: Ile Perrot Sud, the Church in the Village of Ile Perrot, the Village of Vaudreuil, Pointe Cavagnal, Hudson, Rigaud, Graham, Pointe Fortune, and Ile Perrot Nord. Also, a copy of all specifications and reports already brought down at my request in relation to the documents prior to and since 1904, and a statement of the amounts that have been paid for such construction or repairs, and to whom they were paid. Presented April 30, 1917.—*Mr. Boyer*.. .. ..*Not printed.*

122*a*. Return to an Order of the House of the 16th February, 1916, for a copy of all letters, petitions, correspondence, telegrams and reports, exchanged between the Government, the engineers residing in the district, and all other persons, concerning the construction and repairing done to the wharves mentioned below, since 1904, and of all data and reports already produced at my request and relating to documents prior to 1904; also the amounts of money paid for such construction and repairing, and to whom paid:—The wharf at Ile Perrot North, South, and at the Church; of the Village of Vaudreuil; of Pointe Cavagnal; of Hudson; of Graham; of Rigaud, and of Pointe Fortune. Presented April 30, 1917.—*Mr. Boyer*.. .. ..*Not printed.*

122*b*. Return to an Order of the House of the 30th April, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports exchanged between the Government, the resident engineer and all other persons, concerning the construction and repairing done to the wharves at Ile Perrot North, South and at the Church: Village of Vaudreuil, Pointe Cavagnal, Hudson, Graham, Rigaud and Point Fortune since 1904. Also, a copy of all data and reports regarding above already produced at my request relating to documents prior to 1904, showing the amounts of money paid for such construction and repairing, and to whom paid. And also, return to an Order of the House of the 30th April, 1917, for a copy of all letters, petitions, correspondence and telegrams exchanged between the Government, the district engineer, and any other persons concerning either the construction, repairing or purchase of the wharves at Ile Perrot South, the Church in the Village of Ile Perrot, Village of Vaudreuil, Pointe Cavagnal, Hudson, Rigaud, Graham, Pointe Fortune and Ile Perrot North, since 1904. Also a copy of all specifications and reports already brought down at my request in relation to above prior to, and since 1904, giving a statement of the amounts that have been paid for such construction or repairs, showing to whom they were paid. Presented August 13, 1917.—*Mr. Boyer.* *Not printed.*

123. Return to an Order of the House of the 19th April, 1916, for a copy of all letters, petitions, correspondence and telegrams exchanged between the Government, its resident engineer, and all other prsons, concerning the dredging work done at the following places:—Ste. Anne de Bellevue, Pointe Fortune, Ottawa River Channel between Ile au Foin and Ile à Paquin, Graham channel, Rigaud channel, Hudson Heights channel, Hudson, Como, Pointe Cavagnal, channel at Vaudreuil Village, Dorion Bay channel, Ile Perrot Church, Ile Perrot Sud Wharf, and Ile Perrot Nord Wharf. Also, a statement of the amounts paid to different persons, companies, etc., for such work, the dates, etc., and a copy of the estimates already brought down at my request, the whole since 1904. Presented April 30, 1917.—*Mr. Boyer*.. .. ..*Not printed.*

123*a*. Return to an Order of the House of the 16th February, 1916, for a copy of all letters, petitions, correspondence, telegrams and reports exchanged between the Government, the resident engineer of the district, and all other persons, concerning the dredging work done at the places below named, and the amount of money paid to divers, persons companies, etc., for such work, as well as the statements already presented at any request, the whole since 1904:—At the wharf of Ile Perrot, North, South and at the Church; in Dorion Bay channel; at Vaudreuil Village channel; at Pointe Cavagnal; at Como; at Hudson; at Hudson Heights channel; at Graham channel; in the Rigaud River channel; in the Ottawa river; Ile aux Poires channel; at Pointe Fortune, and at Ste-Anne de Bellevue channel. Presented April 30, 1917.—*Mr. Boyer*.. .. .. ..*Not printed.*

124. Return to an Order of the House of the 3rd May, 1916, for a copy of all letters, telegrams, bills, vouchers and memoranda in connection with the repairs to the wharf at Upper Prospect, Halifax County, N.S., in 1915. Presented April 30, 1917.—*Mr. McLean (Halifax)*.. .. ..*Not printed.*

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125. Return to an Order of the House of the 3rd May, 1916, for a copy of all letters, telegrams, bills, vouchers and memoranda in connection with the repairs to the wharf at Shad Bay, Halifax County, N.S., in 1915. Presented April 30, 1917.—*Mr. McLean (Halifax)*.. .. ..*Not printed.*

126. Return to an Order of the House of the 1st February, 1917, for a copy of all correspondence in the possession of the Department of Public Works bearing date after September, 1911, relating to the expenditure of money voted last session for harbour improvements at Tracadie, in the County of Antigonish, including copies of all letters relating to the same written by Mr. G. A. R. Rollings to the said Minister of Public Works or to any other member of the Government. Presented April 30, 1917.—*Mr. Sinclair*. .*Not printed.*

127. Return to an Order of the House of the 3rd February, 1917, for a copy of all letters, telegrams, reports and other documents received by the Government during the years 1915 and 1916, relative to the repairs required on the breakwater at Souris, P.E.I. Presented April 30, 1917.—*Mr. Hughes (Kings, P.E.I.)*.. .. ..*Not printed.*

128. Return to an Order of the House of the 1st February, 1917, for a copy of all correspondence in the possession of the Department of Public Works bearing date after September, 1911, relating to the extension of a breakwater at Breen's Point, in the County of Antigonish. Presented April 30, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

129. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, vouchers, etc., in connection with the construction of the Mushaboom Harbour Wharf, Halifax County, in 1913. Presented April 30, 1917.—*Mr. McLean (Halifax)*.. .. ..*Not printed.*

130. Return to an Order of the House of the 31st January, 1917, for a return showing all expenditures made since March 31, 1916, by the Public Works Department in the several provinces of Canada, specifying the name of the work, the amount already spent thereon, and the estimated total expenditure in each case. Presented April 30, 1917.—*Mr. McLean (Halifax)*.. .. ..*Not printed.*

131. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, vouchers, etc., in connection with the construction of the Port Dufferin West Wharf, Halifax County, in 1913-14. Presented April 30, 1917. —*Mr. McLean (Halifax). Not printed*

132. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, vouchers, etc., in connection with the repairs to the Port Dufferin East Wharf, Halifax County, in 1915. Presented April 30, 1917.—*Mr. McLean (Halifax). Not printed.*

133. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, vouchers, etc., in connection with the construction of a wharf at Ecum Secum West, Halifax County. Presented April 30, 1917.—*Mr. McLean (Halifax)*.. .. ..*Not printed.*

134. Return to an Order of the House of the 27th March, 1916, for a copy of all correspondence, letters, telegrams, etc., in any way referring to the dredging at Margaree Harbour, Inverness County, N.S., during 1913, 1914, 1915 and 1916. Presented April 30, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

135. Copy of Order in Council, P.C. 1142, dated the 24th day of April, 1917, under the provisions of the War Measures Act, 1914, containing regulations under which British ships registered in Canada, or under construction for neutral owners, may until further order be requisitioned by His Majesty for the carriage of foodstuffs, etc., or for any purpose whatsoever; and cancelling Orders in Council, P.C. 2923, dated the 24th day of November 1916, and P.C. 1915, dated the 31st day of March, 1917, in respect thereto. Also certified copy of a report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 30th day of January, 1917, respecting the exercise of the requisitioning power by His Majesty's Government in the case of Canadian vessels. Presented by Hon. Mr. Reid, April 30, 1917.. .. ..*Not printed.*

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136. Return to an Order of the House of the 23rd April, 1917, for a return showing:—1. The names, former post office addresses, occupations and salaries paid to the censors and decoders in the employ of the Government at Hazel Hill and Canso during the year 1916. 2. How much has been expended in connection with this service at Canso and Hazel Hill since the first of August, 1914, up to the present date. 3. How much has been expended in connection with the said service in embracing all the stations in the province of Nova Scotia from August 1, 1914, up to the present date. Presented May 2, 1917.—*Mr. Sinclair*. . . . . *Not printed.*

137. Return to an Order of the House of the 23rd April, 1917, for a copy of all contracts and agreements between Sir Charles Ross, his successors or assigns, and His Majesty the King, represented by the Minister of Militia and Defence, since and including the agreement between them dated the 27th day of March, A.D., 1902. Presented May 2, 1917. *Mr. Northrup*. . . . . *Printed for Sessional Papers only.*

138. Return to an Order of the House of the 23rd April, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of Militia and Defence on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914. 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1914. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented May 2, 1917.—*Mr. Macdonald*. . . . . *Not printed.*

138*a*. Return to an Order of the House of the 2nd May, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of Naval Affairs on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914. 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1911. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented May 16, 1917.—*Mr. Chisholm*. . . . . *Not printed.*

138*b*. Return to an Order of the House of the 2nd May, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of Marine and Fisheries on the 10th day of October, 1911, and how many on the 31st day of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1911. 6. What was the gross amount paid by said Department for salaries and expenses of all

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permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented May 31, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

138c. Return to an Order of the House of the 9th May, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of External Affairs on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1911. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented June 1, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

138d. Return to an Order of the House of the 9th May, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of Justice on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1911. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented June 21, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

138e. Return to an Order of the House of the 14th May, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of Finance on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1911. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented June 29, 1912.—*M. Maclean (Halifax)*.. .. ..*Not printed*

138f. Return to an Order of the House of the 2nd May 1917, for a return showing:—1. How many permanent civil servants and officials were in the employ of the Department of Indian Affairs on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed

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by said Department since 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1914. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented by Hon. Mr. Roche, July 10, 1917.—*Mr. Kyte*.. .. ..*Not printed.*

138*g*. Return to an Order of the House of the 23rd April, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of Agriculture on the 10th day of October, 1911, and how many on the 31st day of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1914. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented August 15, 1917.—*Mr. Hughes (P.E.I.)*.. .. ..*Not printed.*

138*h*. Return to an Order of the House of the 2nd May, 1917, for a return showing:—1. How many permanent civil servants or officials were in the employ of the Department of State and Mines on the 10th day of October, 1911, and how many on the 31st of March, 1917. 2. How many temporary civil servants and employees of all kinds were in the employ of the said Department on the 10th day of October, 1911, and how many on the 31st of March, 1917. 3. How many permanent civil servants or officials were appointed by said Department since the 1st of August, 1914. 4. How many temporary civil servants and employees were employed by said Department since August 1, 1914, 5. What was the gross amount paid by said Department for salaries and expenses to both permanent and temporary civil servants and employees for the fiscal year ending March 31, 1911. 6. What was the gross amount paid by said Department for salaries and expenses of all permanent and temporary civil servants and employees for the fiscal year ending March 31, 1917. 7. How many civil servants were appointed by said Department since October 10, 1911, under the provisions of Section 21 of the Civil Service Act. Presented August 21, 1917.—*Mr. McKenzie*.. .. ..*Not printed.*

139. Return to an address to His Excellency the Governor General of the 23rd April, 1917, for a copy of the Order in Council and all other papers in connection with the awarding of the contract to J. C. Shields and others, or to the Inland Express Company for carrying the mails from Ashcroft to Fort George, B.C. Presented May 2, 1917.—*Mr. Turriff*.. .. ..*Not printed.*

140. Return to an Address to His Excellency the Governor General of the 31st January, 1917, for a copy of all correspondence exchanged with the Governement of the Province of Manitoba concerning a statute passed by the Legislature of Manitoba at its last session, entitled, "An Act to amend the Jury Act"; together with copies of all Orders in Council respecting same. Presented May 3, 1917.—*Sir Wilfrid Laurier*.. *Not printed*

141. Return to an Order of the House of the 7th February, 1917, for a return showing:—1. The number of interned aliens, and nationality of each, employed on public works since the 4th August, 1914. 2. The number employed in industrial work in the provinces of Canada, and the nationality of each, since the 1st of August, 1914. 3. The number so employed at the present time. Presented May 3, 1917.—*Mr. Kyte*.. .. ..*Not printed.*

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142. Return to an Order of the House of the 2nd May, 1917, for a copy of the report of the Royal Commission appointed by Order in Council, 20th September, 1916, to inquire into and report upon the conditions in regard to the delivery of cargoes of coal to coasting vessels in the Maritime Provinces. Presented May 7, 1917.—*Mr. Hughes (Kings, P.E.I.)* . . . . *Not printed.*

143. Return to an Order of the House of the 31st January, 1917, for a return showing:—1. How many applicants for enlistment in the Canadian Overseas Forces have been rejected on account of being physically unfit. 2. How many have been discharged after enlistment for the same reason. Presented May 7, 1917.—*Mr. Steele*. . . . *Not printed.*

143*a*. Return to an Order of the House of the 30th April, 1917, for a return showing:—1. How many Americans have enrolled in Canadian Regiments since the commencement of the war. 2. How many natives of the British Isles are so enrolled in Canada since the 1st of August, 1914. Presented July 31, 1917.—*Mr. Boulay*. . . . . *Not printed.*

143*b*. Return to an Order of the House of the 31st January, 1917, for a return showing:—1. How many men have enlisted in Canada for overseas service. 2. How many of these have been subsequently discharged as unfit. 3. How many of these were discharged in Canada, and how many overseas. Presented May 7, 1917.—*Mr. Graham*. . *Not printed.*

143*c*. Return to an Order of the House of the 14th May, 1917, for a return showing:—1. Whether the Minister of Militia or any of the authorities of the Militia Department has official statistics as to the recruiting of soldiers in Canada for overseas service. 2. If so, what the correct figures are of enlistments in the different overseas regiments raised since August, 1914, to date (*a*) Canadian speaking the French language; (*b*) Canadians speaking the English language and born in Canada; (*c*) British subjects by birth born outside of Canada; (*d*) British subjects by naturalization; (*c*) British subjects by birth born outside of Canada; (*d*) British subjects by naturalization; (*e*) French Canadian soldiers in regiments commanded by officers speaking the English language raised in the province of Quebec; and (*f*) French Canadian soldiers in battalions raised in the other provinces of Canada. Presented June 14, 1917.—*Mr. Lanctôt*. . . . . *Not printed.*

143*d*. Copy of Census Statistics showing Summary of Strength of all Units of the Canadian Expeditionary Forces in England, period 14th May, 1917, together with statement showing number of Canadian troops in France, England, in the Near East, St. Lucia and in Canada, June, 1917. Presented by Sir Edward Kemp, June 15, 1917. . . . *Not printed.*

144. P.C. 2314, dated 7th October, 1916, appointing a Special Seed Commissioner and three assistants, with authority to purchase seed wheat to fill requisitions for seed from municipal governing bodies in districts that have suffered crop failure due to the prevalence of rust and frost. Also, P.C. 3073, dated 14th December, 1916, authorizing the Special Seed Commission to purchase seed oats and seed barley to fill requisitions for seed from municipal governing bodies and farmers' organizations in districts where there is no supply. Presented by Hon. Mr. Burrell, May 8, 1917. . . . . *Not printed.*

145. Return to an Order of the House of the 1st February, 1917, for a copy of all communications, reports and documents concerning the alleged treatment of Thos. Kelly, a prisoner in the Stony Mountain Penitentiary. Presented May 9, 1917.—*Mr. Buchanan. Not printed.*

146. Copy of Order in Council, P.C. 1183, dated 28th April, 1917, authorizing the granting, at the request of His Majesty's Government in England, of a further 300 miles of rails for use in France in connection with the war. Presented by Hon. Mr. Meighen, May 10, 1917. . . . . *Not printed.*

146*a*. Return to an Order of the House of the 13th June, 1917, for a return showing:—1. Between what points on the Canadian Northern Railway Line west of Edmonton the rails are to be taken up to be placed on the Grand Trunk Pacific Line. 2. Between what points on the Grand Trunk Pacific Line west of Edmonton the rails of the Grand Trunk are to be replaced by rails of the Canadian Northern Railway. Presented June 14, 1917.—*Mr. Oliver*. . . . . *Not printed.*

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146*b*. Tabulated statement showing list of points on the Eastern Division of the National Transcontinental Railway from which rails were lifted for shipment overseas to France, mileage lifted at each point and replaced with rails from Intercolonial Railway (together with a map accompanying same). Presented by Hon. Mr. Cochrane, June 21, 1917.. .. ..*Not printed.*

147. Return called for by Section 88, of Chapter 62, Revised Statutes of Canada, requiring that the Minister of the Interior shall lay before Parliament, each year, a return of liquor brought from any place out of Canada into the Territories by special permission in writing of the Commissioner of the Northwest Territories, for the year ending 31st December, 1916. Presented by Hon. Mr. Roche, May 11, 1917.. .. .. ..*Not printed.*

148. Return to an Address to His Excellency the Governor General of the 30th April, 1917, for a copy of the application for Arbitration Boards made to the Labour Department by the Provincial Workman's Association or its officers and the United Mines Workmen of Nova Scotia or its officers. Also a copy of all letters, copies of letters and other documents relating to this matter, along with all letters, papers, other documents and Orders in Council relative to the appointment of a Commission to investigate labour and other conditions in the County of Cape Breton. Presented May 11, 1917.—*Mr. Kyte*.. .. ..*Not printed.*

149. Return to an Order of the House of the 2nd May, 1917, for a copy of all letters, copies of letters, telegrams, reports and all other documents relative to the purchase of the two vessels, *A. J. McKee* and *T. J. Drummonds*, by the Railway Department under the Order in Council dated April 17, 1917. Presented May 14, 1917.—*Mr. Macdonald.* *Not printed.*

150. Return to an Order of the House of the 31st January, 1917, for a copy of all correspondence, telegrams, memoranda, etc., by and with the Department of Railways in connection with the naming of stations on the Halifax and Eastern Railway. Presented May 14, 1917.—*Mr. Maclean (Halifax)*.. .. ..*Not printed.*

151. Return to an Order of the House of the 23rd April, 1917, for a copy of all statements, reports, evidence, letters and other papers and documents in the possession of the Department of Railways and Canals relating to a claim for a horse belonging to one Dan McFarlane, injured at Brinley Brook, N.S., by the Canadian Government Railway. Presented May 15, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

152. Return to an Order of the House of the 25th April, 1917, for a copy of all documents, papers, correspondence and reports concerning the suspension of Polydore Lebel, engineer on the Intercolonial Railway at Rivière du Loup, as a result of a wreck in the year 1916. Presented May 15, 1917.—*Mr. Lapointe (Kamouraska)*.. .. ..*Not printed.*

153. Return to an Order of the House, of the 31st January, 1917, for a copy of all letters, telegrams and other documents relative to the removal of Mr. Spenny as Trackmaster on the Short Line, so-called, of the Canadian Government Railway, and to the appointment of Henry Gray as his successor. Presented May 15, 1917.—*Mr. Macdonald.* *Not printed.*

154. Return to an Address to His Royal Highness the Governor General, of the 7th February, 1916, for a copy of all papers in connection with the appointment of Léon Roy as interpreter in the Department of the Interior; and also a copy of the Order in Council, documents and correspondence relating to his dismissal. Presented May 16, 1917.—*Sir Wilfrid Laurier*.. .. ..*Not printed.*

155. Return to an Order of the House, of the 30th April, 1917, for a copy of all letters, papers, telegrams and other documents relative to the establishment of the Canadian Government *Railway Employees Magazine*, showing the circulation thereof, the cost of production, receipts, and the persons employed in connection therewith, giving a statement of the amount received by said persons from the Railway in any capacity. Presented May 21, 1917.—*Mr. Macdonald*.. .. ..*Not printed.*

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156. Return to an Order of the House, of the 22nd March, 1916, for a Return showing:—1. The number of conductors, brakemen, drivers and firemen, respectively, who were on duty on the Canadian Government Railways between Moncton and Campbellton during the month of February, 1916. 2. The number of hours each of the above mentioned trainmen and enginemen were on duty each trip between said points during said month of February, 1916. Presented May 21, 1917.—*Mr. Copp*.. .. ..*Not printed.*

157. Report of Exchequer Court proceedings under Section 49A of the Indian Act, in respect to the removal of the Indians from Sydney Reserve, Nova Scotia. Presented by Hon Mr. Roche, May 22, 1917.. .. ..*Not printed.*

158. Report of the work of the Military Hospitals Commission from its inception to the present date. Presented by Sir Robert Borden, May 23, 1917. .. ..*Not printed.*

159. Copy of correspondence between Members of the Government and the Canadian Manufacturers Association respecting the purchase of supplies for the Canadian Expeditionary Forces in England and at the Front. Presented by Sir Robert Borden, May 23, 1917.. .. ..*Not printed.*

160. Return to an Order of the House, of the 14th May, 1917, for a copy of the correspondence between the Prime Minister and the ex-Minister of Militia and Defence, which led to the latter's resignation or dismissal from the Government. Presented by Sir Robert Borden, May 23, 1917.—*Mr. Hughes (King's, P.E.I.)*.. .. ..*Not printed.*

161. Return to an humble Address of the Senate to His Excellency the Governor General, dated the 26th day of January, 1917, for a statement showing the date and object of all commissions instituted by the Government of the day, since its accession to power in 1911, up to the present date; the number of days during which each of these commissions sat, giving the names of the individuals who formed part of such commissions, and what was the cost of each to the country. *(Senate.)*.. .. ..*Not printed.*

161*a*. Part Return to an humble Address of the Senate, dated the 7th day of February, 1917, to His Excellency the Governor General, for:—A statement showing the date, the object and the personnel of all commissions instituted by the late Government from its accession to power in 1896, up to the accession to power of the present Government in 1911, the number of days during which each of these commissions set, and what was the cost of each to the country. *(Senate.)*.. .. ..*Not printed*

162. Order in Council P.C. 1433, dated 24th May, 1917, containing regulations concerning the departure out of Canada of male persons who are liable to or capable of national service of a military or other character. Presented by Hon. Mr. Roche, May 29, 1917. *Not printed.*

163. Return to an Address to His Excellency the Governor General, of the 23rd May, 1917, for a copy of the Order in Council, if any, providing that preference in appointments to the Civil Service should be given to returned soldiers. Presented May 29, 1917.—*Mr. Boulay*.. .. ..*Not printed.*

164. Return to an Order of the House, of the 3rd February, 1917, for a copy of all reports findings, evidence, memoranda, etc., in connection with the inquiry into the damages sustained by H.M.C.S. *Grilse* en route from Halifax to Bermuda. Presented May 30, 1917.—*Mr. Maclean (Halifax.)*.. .. ..*Not printed*

165. Return to an Order of the House, of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports in any way referring to the dismissal or retirement of D. McDermid, Superintendent of Fish Hatchery at East Margaree, and the appointment of his successor. Presented May 30, 1917.—*Mr. Chisholm.* *Not printed*

166. Return to an Order of the House, of the 25th April, 1917, for a copy of all letters, telegrams, reports and other papers and documents relative to the application of Willis Keizer of Hall's Harbour, King's County, N.S., for a license to operate a fishing weir at Square Cove, King's County, N.S. Presented May 30, 1917.—*Mr. Maclean (Halifax)* *Not printed.*

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167. Return to an Address to His Excellency the Governor General, of the 23rd April, 1917, for a copy of all correspondence, memoranda, Orders in Council, etc., in reference to the dismissal of Moses H. Nickerson, as Inspector of Life-saving Stations in Nova Scotia. Presented May 30, 1917.—*Mr. Maclean (Halifax)*.. .. ..*Not printed.*

168. Copies of Pension Regulations with amendments and as amended to February 28, 1917, with copies of Orders in Council relating thereto. Presented by Sir Thomas White, May 30, 1917.. .. ..*Printed for sessional papers only.*

168a. Copy of Order in Council, P.C. 277, dated 30th January, 1917, regarding pensions of officers or their dependants in respect of the exchange of officers between the Government of Canada and the Imperial Government. Presented by Sir Edward Kemp, August 20, 1917.. .. ..*Not printed.*

169. Return to an Order of the House, of the 14th May, 1917, for a copy of all letters, correspondence, petitions, telegrams and reports between the Minister of Marine and Fisheries and any person or persons in any way referring to the removal of the salmon nets on that portion of the coast of Inverness extending east and west from the mouth of the Margaree River. Presented May 31, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

170. Return to an Order of the House, of the 2nd May, 1917, for a copy of the report of the Commission appointed to investigate the condition of the Military Hospital at Halfax, with a copy of the evidence taken by said Commission at Halifax and all other documents in the possession of the Department of Militia and Defence in connection with such investigation. Presented May 31, 1917.—*Mr. Sinclair*.. .. .. ..*Not printed.*

171. Return to an Order of the House, of the 7th May, 1917, for a return showing the amount paid or spent by the Department of Militia in advertising for recruits in Canada, showing the persons, firms and corporations to whom the payments were made, up to April 1, 1917. Presented May 31, 1917.—*Mr. Macdonald*.. .. ..*Not printed.*

172. Finding of the Court of Inquiry appointed by the Adjutant-General by Orders dated the 1st May, 1917, for the purpose of collecting and recording evidence in connection with the allegations contained in several newspapers that Troop Trains had been stoned passing through Rivière-du-Loup, Quebec, and other places, and for the purpose of collecting and recording any other evidence which, in the opinion of the Members of the Court, in any way relates to or has a bearing on this matter. Presented by Sir Edward Kemp, May 31, 1917.. .. ..*Not printed.*

173. Finding of the Court of Inquiry appointed by the Adjustant-General by Orders dated the 1st May, 1917, for the purpose of collecting and recording evidence in connection with the allegations contained in several newspapers accusing the citizens of Quebec of maltreating or allowing to be maltreated, soldiers returning from the War and passing through or sojourning in Quebec, and for the purpose of collecting and recording any other evidence which, in the opinion of the Members of the Court, in any way relates to or has a bearing on the matter. Presented by Sir Edward Kemp, May 31, 1917... .. ..*Not printed.*

174. Return to an Order of the House, of the 7th May, 1917, for a copy of all accounts, letters, claims, correspondence and other documents relating to the following amounts mentioned in the Report of the Auditor General 1916, Vol. 11, page L—11:—Mr. Justice L. P. Pelletier, travelling expenses, $877; Mr. Justice I. N. Belleau, travelling expenses, $1,984.44; Mr. Justice T. H. Chauvin, travelling expenses, $1,421.25; Mr. Justice B. LeTellier, travelling expenses, $1,923.80. Presented May 31, 1917.—*Mr. Lanctot*.. .. ..*Not printed.*

175. Return to an Order of the House, of the 30th May, 1917, for a Return showing:—1. The number of persons appointed to permanent position on the Canadian Government Railways from January 1, 1916, to March 31, 1917, who were not previously employed on the said Railways. 2. Their names, salaries and the positions to which they were appointed. Presented May 31, 1917.—*Mr. Copp*.. .. ..*Not printed.*

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176. Return to an Order of the House, of the 12th February, 1915, for a Return showing how many persons of German nationality are employed in the several Departments of the Federal Government, in what capacity and the salaries received respectively. Presented June 1, 1917.—*Mr. Delisle.* . . . .*Not printed.*

177. Return to an Order of the House, of the 1st May, 1916, for a copy of all correspondence and papers relating to the change in the location of the post office at Roseberg, Alberta. Presented June 1, 1917.—*Mr. Buchanan.* . . . .*Not printed.*

178. Return to an Order of the House, of the 8th May, 1916, for a copy of all correspondence, letters and telegrams relating to the dismissal of Augustin D. Lauteigne as Postmaster of Island River, Gloucester County, N.B. Presented June 1, 1917.—*Mr. Turgeon.* *Not printed.*

179. Return to an Order of the House, of the 31st January, 1917, for a copy of all letters and telegrams in the Post Office Department in reference to the removal of Pearson's Post Office, Township of Casey, in the Constituency of Nipissing, from where it was located to its present location. Presented June 1, 1917.—*Mr. Turriff.* . . .*Not printed.*

180. Return to an Order of the House, of the 5th February, 1917, for a copy of all letters, reports, papers and other documents relative to the dismissal of John R. McIntosh as Postmaster of Cummings Mountain, Pictou County, and the appointment of James Cummings as his successor. Presented June 1, 1917.—*Mr. Macdonald.* . . .*Not printed.*

181. Return to an Order of the House, of the 2nd May, 1917, for a Return showing:—The gross amount paid by the Government since October, 1911, to H. P. Duchemin, of Sydney, N.B., for services and disbursements under the Public Inquiries Act, or otherwise. Presented June 1, 1917.—*Mr. Sinclair.* . . . .*Not printed.*

182. Return to an Order of the House, of the 3rd February, 1917, for a copy of all correspondence, letters, telegrams and other documents concerning the cancelling by the Post Office Department of the rural mail contract granted to Hyppolite Lambert of St. Antoine, in the County of Lotbinière, Que. Presented June 1, 1917.—*Mr. Fortier.* *Not printed.*

183. Reports, pursuant to a Resolution of the House adopted on the 18th May, 1916, based on a recommendation of the Joint Committee of both Houses on Printing of Parliament, requesting information from the several Departments of Government with the view to effecting all possible economy in the matter of public printing and the distribution of public documents, and the extent, if any, to which such recommendations have been carried into effect. Presented by Hon. Mr. Patenaude, June 1, 1917. . . .*Not printed.*

184. Return to an Order of the House, of 21st May, 1917, for a copy of all correspondence, reports and recommendations, if any, from the Grain Commission to the Department of Trade and Commerce or any other Department of the Government at Ottawa, following a meeting of the Grain Commissioners held in Lethbridge this year. Presented June 1, 1917.—*Mr. Buchanan.* . . . .*Not printed.*

185. Order in Council passed in conformity with provisions of 4-5 George V., Chapter 20, S-15 (C. N. Railway.)—(*The Senate*). . . . .*Not printed.*

186. Return to an Order of the House, of the 3rd February, 1917, for a return showing the quantity and value of exports in following commodities for the first nine months of present fiscal year:—Horses; brass and manufacturers of same; wheat, breadstuffs; oats and grain other than wheat; automobiles, bicycles, motorcycles and parts of same, including engines and tires; railway cars and parts; chemicals; copper and manufactures of same; cotton manufactures; explosives; iron and steel and manufactures of same; firearms and munitions; leather and manufactures of same; meat and dairy products; alcohol; vegetables, dried and canned; lead; wearing apparel of all kinds; zinc and manufactures of same; paper and manufactures of same. Presented June 4, 1917.—*Mr. Maclean (Halifax).* . . . .*Printed for sessional papers only.*

CONTENTS OF VOLUME 21—*Continued.*

187. Return to an Order of the House, of the 30th April, 1917, for a copy of all documents, correspondence, letters, telegrams, memoranda and reports exchanged between the Sergeant-at-Arms of the House of Commons and the Honourable Albert Sévigny; the Sergeant-at-Arms and the Justice Department, and between the Department of Justice and the Honourable Albert Sévigny, concerning certain effects, furniture and ornaments connected with the Speaker's Apartments. Also, copy of all accounts, receipts, bills of lading and transportation accounts concerning the said effects, furniture and ornaments. Presented June 5, 1917.—*Mr. Lanctot*.. .. ..*Not printed.*

188. Copy of Order in Council P.C. 1457, dated the 29th May, 1917, respecting pay to members of the Civil Service who join the Military forces of Canada either by voluntary enlistment or otherwise from and after the date hereof. Presented by Sir Thomas White, June 6, 1917... .. ..*Not printed.*

189. Copy of General Reports of W. F. O'Connor, K.C., Acting Commissioner *re* Cost of Living, concerning the production, cost, selling prices, and distribution system of refined sugar. Presented by Hon. Mr. Crothers, June 6, 1917
Printed for distribution and sessional papers.

190. Copy of Reports of W. F. O'Connor, on the subject of the Anthracite Coal business in Canada. Presented by Hon. Mr. Crothers, June 6, 1917.
Printed for distribution and sessional papers.

191. Return to an humble Address of the Senate to His Excellency the Governor General, dated the 22nd of May last, showing a copy of:—All correspondence exchanged between the Government or its Ministers, the Minister of Militia, the Militia Council, Major-General F. L. Lessard, C.B., Inspector-General, or any other person, and Lieutenant-Colonel Armand Lavergne, O.C., the 61st Regiment or any other person, on the subject of the territorial defence of the Province of Quebec, as well as copy of all Orders in Council or documents relating to this subject.—(*Senate*) .. ..*Not printed.*

192. Copy of Order in Council, P.C. 1579, dated 8th June, 1917, appointing a Fuel Controller for Canada. Presented by Sir George Foster, May 12, 1917.
Printed for sessional papers only.

192*a*. Copy of Order in Council, P.C. 1460, dated 16th June, 1917, *re* the appointment of an Officer to be known as Food Controller for Canada, and specifying his powers and duties. Presented by Sir Robert Borden, June 19, 1917.
Printed for sessional papers only.

193. Copy of Order in Council, P.C. 1604, dated 11th June, *re* the establishment of "The Board of Grain Supervisors of Canada." And also, Copy of Order in Council, P.C. 1605, dated 11th June, 1917, appointing certain persons as members of "The Board of Grain Supervisors of Canada." Presented by Sir George Foster, May 12, 1917.
Printed for sessional papers only.

194. Copies of Census Statistics of male population of Canada, Census of 1911, between the ages of 20 and 45, both years inclusive, according to conjugal condition and nativity. Presented by Sir Edward Kemp, June 13, 1917.
Printed for sessional papers only.

195. Copies of The King's Regulations and Orders for the Army, 1912, re-printed with amendments published in Army Orders up to 1st August, 1914. Presented by Sir Edward Kemp, June 13, 1917... .. ..*Not printed.*

196. Copies of Manual of Military Law, War Office, 1914. Presented Sir Edward Kemp, June 13, 1917.. .. ..*Not printed.*

197. Copy of Order in Council, P.C. 987, dated 10th April, 1917, as amended by Order in Council No. 1451, dated 25th May, 1917: Regulations, being as Consolidation of and additions to various Orders in Council made in consequence of the War, the whole to be known as the "Defence of Canada Order, 1917." Presented by Hon. Mr. Hazen, June 13, 1917... .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

198. Return to an Order of the House, of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports in any way referring to dismissal, retirement or resignation of John McDonald, as Janitor of public building at Inverness, and the appointment of his successor. Presented June 15, 1917.—*Mr. Chisholm.* *Not printed.*

199. Return to an Order of the House, of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the extension and repairs to McKay's Point Wharf, Inverness County. Presented June 15, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

200. Return to an Order of the House, of the 7th May, 1917, for a copy of the replies which the Government or the Department of Public Works sent to the Resident Engineer or other parties in answer to letters, telegrams, or reports in connection with the breakwater at Souris, P.E.I., during the years 1915 and 1916. Presented June 15, 1917.—*Mr. Hughes (King's, P.E.I.)*.. .. ..*Not printed.*

201. Return to an Order of the House, of the 23rd May, 1917, for a copy of all correspondence, telegrams, recommendations and other communications relating to the dismissal of Hector Urquhart, as lineman on the Dominion Government telegraph line between Grand River and Enon, Cape Breton County, Nova Scotia, and relating to the appointment of Dan. A. McLennan to said position. Presented June 15, 1917.—*Mr. Kyte*.. .. ..*Not printed.*

202. Return to an Order of the House, of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the extension and repairs to Craignish Wharf. Presented June 15, 1917.—*Mr. Chisholm*..*Not printed.*

203. Return to an Order of the House, of the 3rd May, 1917, for a Return showing:—1. The amount which has been paid for stenographic reporting for the different Commissions or inquiries which have been held by the Government since November, 1911, to the present time. 2. The names of the persons to whom these amounts have been paid for stenography and the respective amounts paid to each of them. Presented June 15, 1917.—*Mr. Verville*.. .. ..*Not printed.*

203*a*. Return to an Order of the House, of the 3rd May, 1917, for a Return showing:—1. The amount which has been paid for stenographic reporting for the different Commissions or inquiries which have been held by the Government since November, 1911, to the present time. 2. The names of the persons to whom these amounts have been paid for stenography and the respective amounts paid to each of them. Presented June 28, 1917.—*Mr. Verville*.. .. ..*Not printed.*

204. Return to an Address to His Excellency the Governor General, of the 9th May, 1917, for a copy of all papers, petitions, telegrams and all other documents sent to the Government urging upon them the necessity of abolishing the wet canteen system in the camps overseas. Presented June 15, 1917.—*Mr. Lemieux*.. .. ..*Not printed*

205. Copies of all correspondence, memoranda or other documents received by or sent by the Right Honourable the Prime Minister and the Honourable the Minister of Trade and Commerce, concerning a project to advertise Canadian products by the organization of an exhibition train of sample goods in France. (*Senate*)... .. ..*Not printed.*

205*a*. Supplementary Return to an Order of the Senate, dated the 7th June last, for a Return showing:—Copies of all correspondence, memoranda or other documents received by or sent by the Right Honourable the Prime Minister and the Honourable the Minister of Trade and Commerce, concerning a project to advertise Canadian products by the organization of an exhibition train of sample goods in France *The Senate*.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

206. Letter of the Honourable E. L. Patenaude, M.P., to the Right Honourable the Prime Minister, resigning his position as Secretary of State for Canada, and the letter of the Prime Minister in acknowledgment thereof. Presented by Sir Robert Borden, June 18, 1917.. .. ..*Not printed.*

207. Return to an Order of the House, of the 3rd May, 1917, for a Return showing:—1. How much merchandise has been exported from Canada into Foreign Countries since the first of August, 1914, to the present time? 2. How much of these goods have gone through the Port of Hamburg? 3. What countries have imported this merchandise from Canada, and the respective amounts for each of them? Presented June 18, 1917.—*Mr. Verville*.. .. ..*Not printed.*

208. Return to an Order of the House, of the 3rd February, 1916, for a return showing the itemized disbursements of Ward Fisher, Inspector of Fisheries for Western Nova Scotia, for the year 1912, amounting to $388.40, and the year 1913, amounting to $1,009.84. Presented June 18, 1917.—*Mr. Law*.. .. ..*Not printed.*

209. Return to an Order of the House, of the 23rd April, 1917, for a copy of all papers, documents, petitions, memoranda, correspondence, etc., with the Government of British Columbia or any member thereof with the Fishery Officers of the Marine and Fisheries Department resident in said Province, and with any Company, person or persons relating to prohibition of the export of British Columbia salmon since January 20, 1913. Presented June 18, 1917.—*Mr. McKenzie*.. .. ..*Not printed.*

210. Statement of Amount and Price of Commodities purchased and sold (including export and home consumption) by Cold Storage Companies in Canada from January 1 to December 1, 1916. Presented by Hon. Mr. Crothers, June 18, 1917.. .. ..*Not printed.*

210*a*. Report of W. F. O'Connor, K.C., Acting Commissioner *re* Cost of Living, concerning Cold Storage Conditions in Canada. Presented by Hon. Mr Crothers, July 13, 1917.
Printed for distribution and sessional papers.

210*b*. Copy of Order in Council, P.C. 2021, dated 23rd July, 1917, recommending the further investigation into the premises, books, papers and records of the William Davies Company, Limited, and Matthews-Blackwell, Ltd., as disclosed by the report of W. F. O'Connor, Acting Commissioner on the Cost of Living, on the subject of cold storage conditions in Canada, and appointing G. F. Henderson, A. B. Brodie and Geoffrey Clarkson with all the powers of Examiners under Part I of the Inquiries Act to inquire into the books, papers, etc., of the said companies; also to recommend in writing to the Minister of Labour a standardized system of costs accounting applicable to the cold storage business by which the net profits of cold storage companies in Canada may from time to time be readily ascertained. Presented by Hon. Mr. Crothers, July 25, 1917.. .. ..*Not printed*

211. Return to an Order of the House, of the 11th June, 1917, for a copy of all correspondence, telegrams, requests, petitions and other papers in the possession of the Department of Trade and Commerce relating to providing a supply of salt for the fisheries of the Maritime Provinces. Presented by Sir George Foster, June 22, 1917.
Not printed.

212. Copy of Order in Council, P.C. No. 1725, dated the 25th June, 1917, creating the position of Director of Coal Operations for the southeastern coal fields of the Province of British Columbia and the suthwestern coal fields of the Province of Alberta, known as District 18. And also,—Copy of Order in Council, P.C. No. 1726, dated the 25th June, 1917, appointing W. H. Armstrong, of the City of Vancouver, Director of Coal Operations under the provisions of the above Order in Council, P.C. No. 1725, dated 25th June, 1917. Presented by Sir Robert Borden, June 25, 1917... ..*Not printed.*

212*a*. Return to an Order of the House, of the 14th May, 1917, for a copy of all letters, reports, communications and documents passing between the Minister of Labour and the Department of Labour and the officials of District No. 18, United Mine Workers

CONTENTS OF VOLUME 21—*Continued.*

of Alberta, and the officials of the Alberta and Eastern British Columbia Coal Operators' Association, concerning the requests made by the Miners for an increase in wages due to the increase in the cost of living, between September 1, 1916, and the present time. Presented July 12, 1917.—*Mr. Buchanan*.. .. ..*Not printed.*

213. Return to an Order of the House, of the 13th June, 1917, for a Return showing:—1. How many battalions of infantry left Canada with the First Contingent? 2. The number, and the designations of the different units of artillery which left with the First Contingent? 3. The number and the designation of the different medical corps which left Canada with the First Contingent? 4. The number and the designation of all the other units which left with the First Contingent? 5. The names, rank and duties of the supernumerary officers who left with the First Contingent. Presented June 26, 1917.—*Mr. Lachance*.. .. ..*Not printed.*

214. Return to an Address to His Excellency the Governor General, of the 30th May, 1917, for a copy of all correspondence, letters, cables and other documents exchanged between the Imperial Government or any of its members or officials with the Canadian Government or any of its members or officials, relative to the question of the proposed legislation by the Imperial Parliament to validate certain Acts and proceedings of the Legislature of British Columbia. Presented June 27, 1917.—*Mr. Macdonald*.. .. ..*Not printed.*

215. Return to an Order of the House, of the 4th June, 1917, for a copy of all correspondence between the Chief of the *Hansard* Translation Staff of the House, the Clerk of the House and the Speaker, since April 19, 1917, to date. Presented June 28, 1917.—*Mr. Lemieux*.. .. ..*Not printed.*

216. Return to an Order of the House, of the 27th March, 1916, for a return showing the amounts paid by the Federal Government from the 1st July, 1896, to the 1st October, 1911, to the following newspapers: Le *Canada, La Presse, La Patrie, Le Pays,* of Montreal, *La Vigie* and *Le Soleil,* of Quebec. Presented June 28, 1917.—*Mr. Boulay*.. .. ..*Not printed.*

217. Return to an Order of the House, of the 3rd May, 1917, for a Return showing the number of employees of the following Departments after 1896, and after 1911, respectively, viz.:—Inland Revenue, Interior, Public Works, Marine and Fisheries, Militia and Defence, Labour and Department of Trade and Commerce. Presented June 28, 1917.—*Mr. Boulay*.. .. ..*Not printed.*

218. Return to an Order of the House, of the 7th May, 1917, for a Return showing the number of returned soldiers who have been given employment in the various departments of the Government. Presented June 28, 1917.—*Mr. Lemieux*.. ..*Not printed.*

219. Return to an Order of the House, of the 25th June, 1917, for a copy of the reports made by the Penitentiary Surgeons in connection with the release from Penitentiary of Edward Levi Baugh. Presented July 4, 1917.—*Mr. Murphy*.. .. ..*Not printed.*

220. Return to an Order of the House, of the 21st May, 1917, for a return giving the names and salaries of employees of the Interior and Indian Departments, (*a*) Inside Service and (*b*) Outside Service, who volunteered for overseas service, and who were paid their full civil salary in addition to their military pay and allowances.

Those who volunteered for overseas service and who were paid a sufficient portion of their civil salary in addition to their military pay and allowances to bring their pay up to the amount of their civil salary.

Those who volunteered for overseas service and who received consideration (stating consideration) on account of their civil employment in addition to their military pay and allowances.

Those who volunteered for overseas service and who do not receive any consideration on account of their civil employment in addition to their military pay and allowances. Presented July 5, 1917.—*Mr. Oliver*.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

221. Report of Special Trade Commission to Great Britain, France and Italy, May-September, 1916. Presented by Sir George Foster, July 5, 1917... ..*Not printed.*

222. Return to an Order of the House, of the 13th June, 1917, for a Return showing:—1. The total expenditure connected with Agriculture by the Federal Government in each of the fiscal years from 1904-05 to 1916-17, inclusive. 2. How much money was set apart by the Agricultural Aid Act of 1912 to assist the Provincial Departments of Agriculture to improve and extend their work? 3. How much of above amount was given to each Province, and what was accomplished in each Province as a result of such assistance? 4. How much money was set apart by the Federal Government under the Agricultural Instructions Act of 1913, and under the provisions of the said Act what amounts were respectively allotted each year to the several Provinces? 5. What the general purpose of said Act is, and to what extent that purpose has been made effective in each Province. Presented July 5, 1917.—*Mr. Edwards.*
Printed for sessional papers only.

223. Return to an Order of the House, of the 11th June, 1917, for a Return showing:—1. Whether Mr. Giard, ex-M.P.P. for Compton, is an employee of the Government? 2. If so, since when? 3. The number of employees under his orders and their respective names? 4. What salary does said Giard receive? 5. The salary of each employee under his charge? 6. Whether he has bought, for the Government, any animals for breeding purposes? 7. If so, how many, and the price paid for each? 8. Where these animals were bought? 9. How many of them have been rejected or returned to the Government or to Mr. Giard? 10. If any have been refused or returned, why? 11. Where the said breeding animals are at present? 12. What the Government or the Department of Agriculture intends to do with the animals so refused and returned to Mr. Giard? Presented July 5, 1917.—*Mr. Gauvreau* *Not printed.*

224. Return to an Address to His Excellency the Governor General, of the 31st January, 1917, for a copy of all documents, letters, messages, correspondence, reports and particularly an Order in Council dated 6th December, 1898, respecting the exemption from military service of the Doukhobors. Presented by Hon. Mr. Roche, July 9, 1917. —*Mr. McCraney*.. .. ..*Not printed.*

225. Return to an Address to His Excellency the Governor General, of the 31st January, 1917, for a copy of all Orders in Council and other documents on file in the Department of Marine and Fisheries relating to the requisitioning of Canadian ships by the Canadian Government. Presented July 11, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

226. Return to an Order of the House of the 7th June, 1917, for a return showing the number of recruiting officers which have been appointed in the province of Quebec, with the names, addresses, nature of functions and salaries of the same. Presented July 11, 1917.—*Mr. Carvell*.. .. ..*Not printed.*

226*a*. Return to an Order of the House of the 18th June, 1917, for a return showing:—1. The names and addresses of the parties on Prince Edward Island who have been engaged or who are now engaged in recruiting for the army and navy or doing other work of a like military character, since August, 1914. 2. The remuneration or pay each of the said parties receives and the allowance given for travelling or other expenses. 3. The total amount each person has received up to the 1st of June, 1917. Presented July 31, 1917.—*Mr. Hughes (P.E.I.)*.. .. ..*Not printed.*

227. Return to an Order of the House of the 12th April, 1916, for a return showing:—1. How many clerks there are in the Post Office Department who belong to and are paid from the outside service vote, and who work in the inside service. 2. The names of said clerks. 3. Salary paid to each. 4. How long each has been in the service of the Department. 5. If all or any of the clerks have passed any examination. If so, what examination, and on what date or dates. Presented July 14.—*Mr. Turriff*..*Not printed.*

228. Copy of a memorandum presented by the Southern Slav Committee to the representatives of the British Dominions, setting forth the aims and aspirations of the Jugo-slavs (Serbs, Croats and Slovens) subject to Austro-Hungarian rule. Presented by Sir Robert Borden, July 20, 1917.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

229. Claims made by Minister of Justice relating to payment of duties by certain provinces. (*Senate.*) . . . . *Not printed.*

230. Copy of Report of Honourable Sir Ezekiel McLeod, Chief Justice of the Province of New Brunswick, and the Honourable Louis Tellier, retired Judge of the Superior Court of the Province of Quebec, Commissioners appointed under the Inquiries Act of Canada, being Revised Statutes of Canada, 1906, Chapter 104 and Amending Acts, by virtue of an Order in Council passed on the 6th June, 1917, whereby the said Commissioners were empowered and directed to conduct an inquiry and investigation for the purpose of reviewing and considering the evidence taken by Mr. Justice Galt, a Commissioner appointed by the Lieutenant-Governor of Manitoba on the 15th day of July, 1916, to investigate and report upon certain matters of concern to the Local Government of the said province, in the execution of such Commission, and to review and consider his reports and findings on such evidence; and to report whether such evidence sustains or supports the findings of the said Commissioner, as set forth in such reports, in so far as they reflect upon or prejudicially affect the honour or integrity of the Hon. Robert Rogers or the honesty of his dealings or transactions. Presented by Hon. Mr. Doherty, July 27, 1917. . . *Printed for distribution—Members and Senators only.*

230*a*. Copy of evidence, exhibits, etc., in respect to the Report of Honourable Sir Ezekiel McLeod, Chief Justice of the Province of New Brunswick, and the Honourable Louis Tellier, retired Judge of the Superior Court of the Province of Quebec, Commissioners appointed under the Inquiries Act of Canada, being Revised Statutes of Canada, 1906, Chapter 104 and Amending Acts, by virtue of an Order in Council passed on the 6th June, 1917, whereby the said Commissioners were empowered and directed to conduct an inquiry and investigation for the purpose of reviewing and considering the evidence taken by Mr. Justice Galt, a Commissioner appointed by the Lieutenant-Governor of Manitoba on the 15th day of July, 1916, to investigate and report upon certain matters of concern to the Local Government of the said province, in the execution of such Commission, and to review and consider his reports and findings on such evidence; and to report whether such evidence sustains or supports the findings of the said Commissioner as set forth in such reports, in so far as they reflect upon or prejudicially affect the honour or integrity of the Hon. Robert Rogers, or the honesty of his dealings or transactions. Presented by Hon. Mr. Doherty, August 9, 1917. . . . . *Not printed.*

231. Return to an Order of the House of the 13th June, 1917, for a copy of all correspondence, letters, telegrams and other papers relating to a contract for carrying mails between Grand River and Fourchu, in the County of Richmond, Nova Scotia, in the years 1916 and 1917. Presented July 28, 1917.—*Mr. Kyte*. . . . . *Not printed.*

232. Return to an Order of the House of the 30th April, 1917, for a copy of all papers, letters, telegrams and documents relative to the purchase of land in Vancouver, B.C., for the purpose of an armoury, since January 1, 1913. Presented July 30, 1917.—*Mr. Macdonald*. . . . . *Not printed.*

233. Return to an Order of the House of the 1st February, 1917, for a return showing:—1. The names and present rank of all appointees as Chief Recruiting Officers or as District or Special Recruiting Officers, not local or regimental, made since the beginning of the war. 2. The dates of their respective appointments. 3. The ages and vocations of respective appointees. 4. The name of military organization, if any, in which appointees had previously served. 5. The rank of appointees while serving in any military organization. 6. Whether the services of any of these appointees have been dispensed with. 7. If so, their names, and dates on which they were retired. Presented July 31, 1917.—*Mr. Turriff*. . . . . *Not printed*

234. Return to an Order of the House of the 31st January, 1917, for a return showing:—1. The date of the last order given by the Government to the Ross Rifle Company. 2. The number of rifles ordered. 3. Whether a recommendation of the British Army Council for the utilization of existing Canadian facilities in manufacturing the new and improved Lee-Enfield was received by the Government. 4. The date of the recommendation, and when it was received. 5. Whether the recommendation has been acted upon Presented July 31, 1917.—*Mr. Turriff*. . . . . *Not printed*

CONTENTS OF VOLUME 21—*Continued.*

235. Return to an Order of the House of the 20th June, 1917, for a return showing:—1. The names of the members of the military staff at North Vancouver. 2. Their respective duties or occupations. 3. The rank and rate of pay of each. 4. The amount that has been paid to each. 5. Upon what date or dates the members of the said staff enlisted, and how long they have been attached to the staff. Presented July 31, 1917.—*Mr. Murphy*.. .. ..*Not printed.*

235*a*. Return to an Order of the House of the 21st June, 1917, for a return showing the names, rank, pay, and nature and place of employment of all officers attached to headquarters at Halifax and the various departments of the military service or connected in any way with Military Division No. 6. Presented August 2, 1917.—*Mr. Tobin*.. ..*Not printed.*

236. Return to an Order of the House of the 18th July, 1917, for a return giving a list of the different Commissions created since the beginning of the war, concerning the soldiers, their pensions, hospitals, etc., showing the names of the various Commissioners who have comprised said Commissions. Presented July 31, 1917.—*Mr. Boulay*.. .. ..*Not printed.*

237. Copy of Financial Statements in respect to the Canadian Northern Railway System: 1. Balance Sheet, 30th June, 1916. 2. Statement of Securities Issued and Fixed Charges, 30th June, 1917. 3. Statement of Liabilities, 15th June, 1917. 3*a*. Statement of Equipment Account. 4. List of Securities for Loans. 5. Gross and Net Earnings, 30th June, 1917. 6. Comparison of Earnings, 1915, 1916 and 1917. 7. Statement *re* Capital Expenditure and Betterments, year ending 30th June, 1917. 8. Mileage. And also,—Statements showing bonds, etc., authorized, issued and outstanding, and net proceeds therefrom; interest payable during the period July 1, 1917, to June 30, 1918; and estimated cash requirements for period July 1, 1917, to June 30, 1918, in respect to the Grand Trunk Railway and Grand Trunk Pacific Branch Lines. Presented by Sir Robert Borden, July 20, 1917.. .. ..*Not printed.*

237*a*. Copy of Mortgage Deed of Trust securing an issue of $45,000,000 of Canadian Northern Railway securities, guaranteed by the Dominion Government, issued under the legislation of 1914. Also,—Copy of Mortgage Deed dated 26th June, 1916—The Canadian Northern Ontario Railway Company to His Majesty the King—securing certain advances from a loan of $15,000,000 made by His Majesty to the Canadian Northern Railway Company. And also,—Copy of Audit of Revenue and Expenditure Accounts of the Canadian Northern Railway System for the months of May, June, July, August, September, October, November and December, 1916, and for January and February, 1917. Presented by Sir Thomas White, August 8, 1917.. .. ..*Not printed.*

237*b*. Statement of amounts advanced by the Government of Canada to the Canadian Northern Railway Company on interest account to date. And also,—Financial Statements of the Canadian Northern Railway, as follows:—1. Interim Condensed Balance Sheet as at April 30, 1917. 2. Statement of estimate of cost to complete lines and terminals under construction and financial provision for same. 3. Statement of Contractors' and other Construction accounts outstanding, 30th June, 1917. 4. Memorandum *re* unsold lands. 5. Estimate of amount required for betterments and rolling stock for three years. Presented by Sir Thomas White, August 13, 1917.. .. ..*Not printed.*

238. Copy of Order in Council, P.C. 1881, dated 19th August, 1916, recommending that in the case of officers, warrant officers and non-commissioned officers reverting to lower rank in order to proceed to the front, no reduction in separation allowance or pension shall be made. And also,—Copy of Order in Council, P.C. 2008, dated 20th July, 1917, cancelling Order in Council, P.C. 1615, dated 13th June, 1917, and amending Order in Council, P.C. 1881, dated 19th August, 1916, in respect to separation allowances and pensions to those reverting to lower rank, in order to proceed to the front. Presented by Sir Edward Kemp, August 2, 1917.. .. ..*Not printed.*

239. Return to an Order of the House of the 30th July, 1917, for a copy of all correspondence exchanged between the Board of Trade of the City of Quebec and the Prime Minister on the subject of the Report of the Special Commission on Railways. Presented August 2, 1917.—*Sir Wilfrid Laurier*.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

240. Return to an Order of the House of the 13th June, 1917, for a statement showing the travelling expenses of Maurice LeBlanc, general foreman of the Department of Public Works, Bonaventure County, since his appointment to date. Presented August 8, 1917. —*Mr. Marcil (Bonaventure)*.. .. ..*Not printed.*

241. Return to an Order of the House of the 30th April, 1917, for a copy of all letters, petitions, correspondence and telegrams exchanged between the Government, the resident engineer and all other persons concerning the dredging work done at Ste. Anne de Bellevue, Pointe Fortune, Ottawa River channel between Ile au Foin and Ile Paquin. Graham channel, Rigaud channel, Hudson Heights channel, Ile Perrot Church, Ile Perrot South wharf and Ile Perrot North wharf, since 1904. Also a statement showing the amounts paid to different persons or companies for such work, giving the dates of payment, along with a copy of the estimates already brought down at my request regarding the above, previous to 1904. Return to an Order of the House of the 30th April, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports exchanged between the Government, the resident engineer of the district, and all other persons, concerning the dredging work done since 1904 at the wharf of Ile Perrot North, South and the Church, Dorion Bay channel, Vaudreuil Village channel, Pointe Cavagnal, Como, Hudson Heights channel, Graham channel, Rigaud River channel, Ottawa River, Iles aux Poires channel, Pointe Fortune and Ste. Anne de Bellevue channel. Also a statement showing the amount of money paid to divers persons, companies, etc., for such works, along with copy of statements already presented at my request in connection with the same work, previous to 1904. Presented August 8, 1917. —*Mr. Boyer*.. .. ..*Not printed.*

242. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the extension and repairs to Finlay Point wharf. Presented August 8, 1917.—*Mr. Chisholm*.. .. .. ..*Not printed.*

243. Return to an Order of the House of the 30th April, 1917, for a copy of all correspondence in the possession of the Department of Public Works bearing date after September 1, 1915, relating to wharves, breakwaters and other public works situate in the County of Antigonish, Nova Scotia. Presented August 8, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

244. Return to an Order of the House of the 7th May, 1917, for a copy of all documents, correspondence, reports, accounts, pay-lists, etc., in connection with the work done on the Government wharves at Cross Point, Miguasha, St. Omer and New Carlisle, Quebec, since 1912. Presented August 8, 1917.—*Mr. Marcil (Bonaventure)*... ..*Not printed.*

245. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the wharf at Marble Mountain. Presented August 13, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

246. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the extension of the pier at Margaree Harbour. Presented August 13, 1917.—*Mr. Chisholm*.. .. .. ..*Not printed.*

246*a*. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the breakwater at Margaree Harbour. Presented August 13, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

247. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the Port Hood wharf. Presented August 13, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

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248. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present time, in any way referring to the opening of Inverness Harbour. Presented August 13, 1917.—*Mr. Chisholm*. . . . . *Not printed.*

249. Return to an Order of the House of the 23rd April, 1917, for a copy of all papers, documents, petitions, memoranda, correspondence, etc., with reference to the Government of the Dominion of Canada building competing telephone lines in British Columbia paralleling lines already in operation of the Okanagan Telephone Company, Limited. Presented August 13, 1917.—*Mr. Carvell*. *Not printed.*

250. Return to an Order of the House of the 30th April, 1917, for a copy of all correspondence in the Department of Public Works bearing date after September 1, 1915, relating to wharves, breakwaters and other public works in the County of Guysborough, Nova Scotia. Presented August 13, 1917.—*Mr. Sinclair*. . . . . *Not printed.*

251. Return to an Order of the House of the 30th April, 1917, for a copy of all papers, records and other documents concerning the reference by the Dominion Government to the question relating to the exclusive right of fishing in the tidal waters of the province of Quebec. Presented August 15, 1917.—*Mr. Lemieux*. . . . . *Not printed.*

252. Return to an Order of the House of the 9th July, 1917, for a return showing the names of all persons employed in connection with the Office of the Commissioner of Live Stock in the Province of Saskatchewan, showing the salaries and expenses paid them; and also showing the number of stallions and bulls placed in Saskatchewan when the said office was established. Presented August 15, 1917.—*Mr. Thomson (Qu'Appelle)*. *Not printed.*

253. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, telegrams and reports between the Department of the Naval Service of the Department of Marine and Fisheries, and any and all persons in connection with the seizure of certain fishery boats, fishing tackle and equipment being used in the illegal fishing of lobsters in the Straits of Northumberland in the fall of 1916, together with a copy of the evidence taken before one M. G. Teed, Esquire, acting as a commissioner to inquire into this matter, and his report and finding thereon. Presented August 16, 1917.—*Mr. Copp*. *Not printed.*

254. Return to an Order of the House of the 30th July, 1917, for a copy of all correspondence between the Department of Militia and Defence of Canada, the War Purchasing Commission of Canada, and the British War Office, concerning a target practice rod or the use of same by the Canadian Expeditionary Force. Presented August 20, 1917.—*Mr. Maclean (Halifax)*. . . . . *Not printed.*

255. Return to an Order of the House of the 7th June, 1917, for a return showing:—1. Whether the Department of Agriculture supply thoroughbred bulls for improvement of stock to applicants for the same. 2. If so, if any such bulls have been sent into the County of Dorchester, Quebec, and when. 3. At whose request these bulls were sent, and if they belonged to the Department of Agriculture. 4. If so, on what condition they were supplied. 5. From whom the department purchased the animals referred to. 6. The price paid. 7. If any official of the Department of Agriculture has made an investigation as to where these bulls are at the present time. 8. If so, the substance of their report. 9. Whether the said bulls are being used for the purpose for which they were intended. Presented August 21, 1917.—*Mr. Lanctôt*. . . . . . *Not printed.*

256. Return to an Order of the House of the 1st August, 1917, for a return showing the amount which has been paid to the Sydney *Daily Post*, newspaper, by all the departments of the Government for printing and advertising, since the 1st of November, 1911. Presented August 21, 1917.—*Mr. Kyte*. . . . . *Not printed.*

257. Return to an Order of the House of the 1st August, 1917, for a return showing the gross amount paid to the Halifax *Herald*, the *Evening Mail*, Halifax, and the Royal Print and Lithographing Company, Halifax, by all the departments of the Government for printing, advertising and all other services since November 1, 1911. Presented August 21, 1917.—*Mr. Sinclair*. . . . . *Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

258. Return to an Order of the House of the 18th June, 1917, for a copy of all accounts, papers, claims and correspondence regarding demands put forward by all persons who have claimed to have sustained loss or damage by the fire in the Parliament Buildings in February, 1916. Presented August 21, 1917.—*Mr. Lanctôt*. . .. .*Not printed.*

259. Return to an Order of the House of the 14th May, 1917, for a copy of all communications, letters, reports, petitions and other documents on behalf of the Physicians and Medical Associations of this country, asking for the repeal of The Proprietary or Patent Medicine Act and the presentation of a new Act on the matter in order to render more efficient the control of these medicine preparations, and to add on the prohibition list such drugs or medicines as are generally dangerous to health and conducive to certain criminal practices. Presented August 21, 1917.—*Mr. Lapointe (Kamouraska).* *Not printed.*

260. Copy of correspondence between the Honourable Robert Rogers and the Right Honourable Sir Robert Borden, Prime Minister, with reference to the resignation of the former as Minister of Public Works of Canada.—(*The Senate.*) .. ..*Not printed.*

261. Return to an Order of the Senate dated the 11th day of July, 1917, for a Statement showing the number of officers and men of the Canadian Expeditionary Force who have been classed as unfit for military service; whether the military authorities have given consideration to the possibility of utilizing the services of those men in a secondary capacity; whether those who have been classed as unfit continue to draw military pay; the number who have deserted from the various units between 1st October, 1914, and 1st June, 1917; and the number discharged from the various units since 1st October, 1914.—(*The Senate.*) .. ..*Not printed.*

262. Return to an Order of the Senate, dated 7th June last, for a return showing:—1. The name and rank of each person who at the outbreak of the war in August, 1914, was an officer, commissioned or provisional, of the 78th Regiment (Highlanders), of Pictou County, Nova Scotia. 2. The length of time each of such persons was attached to said regiment. 3. (*a*) The name of each of said officers who joined the Canadian Overseas Forces. (*b*) The unit to which he was attached. (*c*) The rank with which he was attached. (*d*) The date at which he was attached. 4. The name of each person who since the outbreak of war became attached as provisional officers to said 78th Regiment and the date at which such person became attached and his rank. 5. (*a*) The name of each of the officers referred to in paragraph 4 who joined the Canadian overseas forces. (*b*) The unit to which he was attached. (*c*) The rank with which he was attached. (*d*) The date at which he was attached. 6. The name of each of the officers referred to in each of the foregoing paragraphs who were in active service at the fighting front, the units with which they served, and the length of time they served. 7. Particulars as to each of the said officers showing where each one was on May 1, 1917, to what unit he was attached, and what his rank was at that time. 8. If any of these officers have gone to the fighting front since May 1, state name, unit, rank and date.—(*The Senate.*) *Not printed.*

263. Part return to an humble Address of the Senate to His Excellency the Governor General, dated the 8th instant, showing all the correspondence between the Department of Militia and Defence and Clarence J. McCuaig; also, between the same and the first Purchasing Committee appointed by Sir Robert Borden, of which the Honourable Robert Rogers was Chairman, and between the said Clarence J. McCuaig and the Committee of which the Honourable Sir Edward Kemp is or was Chairman, or with any of the members of the said committee.—(*The Senate.*) .. ..*Not printed.*

264. Eighth Annual Report of the Commission of Conservation for the fiscal year ending 31st March, 1917. Presented by Hon. Mr. Burrell, September 1, 1917.. .. ..*Not printed.*

265. Return to an Order of the House of the 30th August, 1917, for a return showing:—1. The number of additional buildings and offices that have been rented by the various departments of the Government in the City of Ottawa during the calendar years, 1914, 1915, 1916 and 1917. 2. The names of the lessors, the length of the lease and the respective rentals of said buildings. 3. What department in each case is occupying said premises. Presented September 3, 1917.—*Mr. Sinclair*.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Continued.*

266. Return to an Order of the House of the 11th July, 1917, fo a copy of all correspondence and other documents relating to the granting to beam trawlers registered in the United States the privilege of using ports in the Province of Nova Scotia for the purchasing of supplies, the shipping of men, etc., without license therefor as required under the modus videndi. Presented September 3, 1917.—*Mr. Kyte*.. .. ..*Not printed.*

267. Copy of contract dated 8th March, 1917, between His Majesty the King and Wallace Shipyards, Limited, for the construction and delivery of one wooden auxiliary sailing ship. Also,—Copy of contract dated 1st June, 1917, between His Majesty the King and Lamond and Harrison for the construction and delivery of one wooden auxiliary sailing ship. Presented by Hon. Mr. Cochrane, September 3, 1917.. .. ..*Not printed.*

268. Return to an Order of the Senate, dated the 15th day of June last, for a return made to an Order of the House of Commons, of the 7th February, 1916, for a copy of all correspondence and reports on the claims of Sealers of British Columbia under the last treaty with the American Republic, and all papers connected therewith.—(*The Senate.*) *Not printed.*

269. Copy of Order in Council, P.C. 2245, dated 3rd September, 1917, appointing the Deputy Minister of Justice, Oliver Mowat Biggar, of the City of Edmonton, John H. Moss, of the City of Toronto, Louis Loranger, of the City of Montreal, and Lt.-Col. H. A. C. Machin, of the Town of Kenora, Ont., a council to advise and assist in the administration and enforcement of the Military Service Act, 1917, to be known as the Military Service Council. Presented by Sir Robert Borden, September 4, 1917.. ..*Not printed.*

270. Return to an Order of the House of the 21st May, 1917, for a copy of all reports, letters, telegrams, correspondence and any other papers in connection with the question of locating the 210th Battalion at Regina and Moosejaw respectively during the winter of 1916-17. Presented September 6, 1917.—*Mr. Knowles*.. .. ..*Not printed.*

271. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the appointment of a man in charge of the storm signals at Grand Etang and Margaree Harbour. Presented September 6, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

272. Return to an Order of the House of the 7th May, 1917, for a return showing the different rural mail routes established in the constituency of Qu'Appelle since the 1st day of January, 1916, showing their location and date of establishment. Also, a list of all rural mail routes now being established or under consideration at the present time in the same constituency. Presented September 7, 1917.—*Mr. Thomson (Qu'Appelle).* *Not printed.*

273. Return to an Order of the House of the 6th March, 1916, for a copy of all telegrams, letters, petitions and documents of all kinds in any way referring to the change in the Inverness-Margaree mail route from the west to the east of the Margaree river, from a point at Margaree Forks to Chapel Bridge. Presented September 7, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

274. Copy of Order in Council, P.C. 2199, dated 10th August, 1917: Rules and Regulations enacted in lieu of the Classification, Rules and Regulations contained in Order in Council, P.C. 1296, of the 15th May, 1917, in respect to War badges for members of the Canadian Expeditionary Force. Presented by Sir Edward Kemp, September 13, 1917. *Not printed.*

275. Copy of Order in Council, P.C. 2552, dated 13th September, 1917, recommending that Certificates of Naturalization may be issued under the Naturalization Act, 1914, to alien enemies who have resided for many years in Canada, on its being shown that they are clearly in sympathy with the United Kingdom and its allies in the present war, and that they have no pro-German or other alien enemy affiliations or connections. Presented by Sir Robert Borden, September 14, 1917.. .. ..*Not printed.*

CONTENTS OF VOLUME 21—*Concluded.*

276. Copy of *Canada Gazette* dated 12th September, 1917, containing a list and location of Local Tribunals established to hear and decide applications for certificates of exemption from Military Service. Presented by Hon. Mr. Doherty, September 14, 1917. *Not printed.*

277. Copies of Orders in Council, dated 15th September and 17th September, 1917, respectively, appointing Registrars for the Provinces of British Columbia, New Brunswick, Quebec, Saskatchewan, Manitoba, Ontario, Alberta and Prince Edward Island, under the provisions and for the purposes of the Military Service Act, 1917. Presented by Sir Robert Borden, September 17, 1917.. .. ..*Not printed.*

278. Return to an Address to His Excellency the Governor General of the 2nd May, 1917, for a copy of all Orders in Council, letters, telegrams, etc., to or from any employee of the Government in reference to the improvement and equipment of the life-saving station at Whitehead, Guysborough County, N.S. Presented September 17, 1917.—*Mr. Maclean (Halifax)*.. .. ..*Not printed.*

279. Return to an Order of the House of the 14th May, 1917, for a copy of all letters, petitions, correspondence, telegrams and reports received by the Government since September, 1911, to the present day, in any way referring to the dredging and building of piers at Mabou Harbour. Presented September 19, 1917.—*Mr. Maclean (Halifax).* *Not printed.*

280. Return to an Order of the House of the 13th August, 1917, for a return showing:—1. The different amounts paid for commissions and expenses in connection with the flotation of the different loans made by Canada since 1914. 2. The respective amounts paid in connection with each loan. Presented September 19, 1917—*Mr. Macdonald.* *Not printed.*

281. Return to an Order of the House of the 5th September, 1917, for a copy of all correspondence, letters, telegrams, petitions, etc., in any way referring to an application for a public wharf at Chimney Corners, Inverness County, N.S. Presented September 19, 1917.—*Mr. Chisholm*.. .. ..*Not printed.*

282. Return to an Order of the House of the 29th August, 1917, for a return showing copies of all accounts, memoranda, vouchers, telegrams, letters, etc,, in reference to payments to George H. Boyce, of Windsor, N.S., District Foreman of Public Works Department, since his appointment to office. Presented September 19, 1917.—*Mr. Maclean (Halifax).* *Not printed.*

283. Return to an Order of the Senate dated the 1st day of March, 1916, showing a copy of all correspondence between the Government and the British Columbia Boards of Trade, and also between the Government and the Canadian Manufacturers' Association, in reference to the request made by the British Columbia Boards of Trade for the appointment of a Dominion Customs Officer at the Port of New York.—*(Senate.).* *Not printed.*

284. Part return to an humble Address of the Senate, dated the 14th of August, 1917, to His Excellency the Governor General, for a return showing the name of every judge of the Supreme, District and County Courts in all the provinces of Canada, for the year 1916, together with a statement of the moneys paid to each of such judges for that year for (*a*) salaries; (*b*) travelling expenses; (*c*) allowances of all kinds; (*d*) for services as Commissioners; (*e*) and any other payments; and also, showing the names of judges who have performed services as Commissioners, or in any other public capacity without compensation.—*(Senate.)*.. .. ..*Not printed.*

285. Return to an humble Address of the Senate, dated the 9th August, 1917, to His Excellency the Governor General, showing all the documents relating to the purchase by the Militia Department of "Bonnie Bel Air" from W. T. Rodden, Esq., a part of number nine (9) on the official plan and book of reference of the Parish of Lachine and specially the report of the lawyers who examined the titles.—*(Senate.)*.. ..*Not printed.*

Elk falls, Campbell river.

DEPARTMENT OF THE INTERIOR—CANADA
Hon. W. J. ROCHE, Minister, W. W. CORY, Deputy Minister.
DOMINION WATER POWER BRANCH,
J. B. CHALLIES, C.E., Superintendent.

WATER RESOURCES PAPER No. 18.

REPORT
OF THE
BRITISH COLUMBIA HYDROMETRIC SURVEY
FOR
The Calendar Year 1915

BY

R. G. SWAN, B.A. Sc.
Chief Engineer

Prepared under the direction of the Superintendent of Water Power.

OTTAWA.
PRINTED BY J. de L. TACHÉ,
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1917.

To Field Marshal His Royal Highness Prince Arthur William Patrick Albert, Duke of Connaught and of Strathearn, K.G., K.T., K.P., etc., etc., etc., Governor General and Commander in Chief of the Dominion of Canada.

MAY IT PLEASE YOUR ROYAL HIGHNESS:

The undersigned has the honour to lay before Your Royal Highness the British Columbia Hydrometric Survey Report for 1915.

Respectfully submitted,

W. J. ROCHE,

Minister of the Interior.

OTTAWA, May 1, 1916.

DEPARTMENT OF THE INTERIOR,
OTTAWA, May 1, 1916.

The Honourable W. J. Roche, M.D.,
Minister of the Interior.

SIR,—I have the honour to submit the British Columbia Hydrometric Survey Report for 1915, and to recommend that it be published as Water Resources Paper No. 18 of the Dominion Water Power Branch.

I have the honour to be, sir,
Your obedient servant,
W. W. CORY,
Deputy Minister of the Interior.

DEPARTMENT OF THE INTERIOR, WATER POWER BRANCH,

OTTAWA, May 1, 1916.

W. W. Cory, Esq., C.M.G.,
Deputy Minister of the Interior.

SIR,—I have the honour to submit the attached report by R. G. Swan, B.A.Sc., Chief Engineer of the British Columbia Hydrometric Survey.

In view of its important bearing on the industrial development of southern British Columbia, I would recommend that it be published as Water Resources Paper No. 18 of the Dominion Water Power Branch.

Respectfully submitted,

J. B. CHALLIES,

Superintendent, Dominion Water Power Branch.

Ottawa, May 1, 1916.

J. B. Challies, Esq., C.E.,

Superintendent,
Dominion Water Power Branch,

Department of the Interior,
Ottawa.

Sir,—I have the honour to transmit herewith my Annual Report of the British Columbia Hydrometric Survey for the calendar year 1915, together with the reports of engineers in charge of divisions.

Your obedient servant,

R. G. SWAN,

Chief Engineer.

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REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER I.

REPORT OF R. G. SWAN, B.A.Sc.

CHIEF ENGINEER.

CHAPTER I.

REPORT OF THE CHIEF ENGINEER.

SCOPE OF WORK.

In addition to maintaining the stream measurement work previously established in the nine districts of the southern part of the province, the field of operations has been extended to include that part of central British Columbia opened up for settlement and development by the completion of the Grand Trunk Pacific Railway. The work in this district was only commenced in May of 1915 and the few stations established were installed at the request of parties who expected to utilize the water in the near future.

Practically no extension of the work has been made in the other districts, the men and funds available being only sufficient for that already established.

The work during the past year has supplied additional information which necessitates the revising of much data which the urgency of the requests of engineers and others in previous years had induced the survey to supply. These revisions are being carefully gone into and I would recommend that a hydrometric bulletin including all such data acquired since the commencement of the survey be published at the end of the year.

Co-operation with the British Columbia Lands Branch and the Dominion Parks Branch has been continued, investigations being made and reports submitted on the following,—applications for lease of foreshore lands for the purpose of removing sand and gravel, for the purchase of lands under irrigation conditions, for the setting aside of certain lands for the protection of the water supply, for the reserving from settlement of certain lands for storage purposes in connection with irrigation, and other applications of a general nature.

In connection with a hydrometric bulletin which the Provincial Water Rights Branch proposed to publish, complete flow data was supplied that Branch in October for the period January 1, to September 30, 1915. The furnishing of the data at that time involved a very considerable extra amount of work, the staff having been so depleted by the members enlisting for overseas service that it was necessary to bring some of the field engineers into the office to assist in the compilation.

Mutual benefit has been derived by the continued co-operation between the Provincial Water Rights Branch and this Survey.

The Conservation Commission of Canada has again been furnished with all the hydrometric data required in connection with its forthcoming report on the water powers of British Columbia. Every effort has been made to secure the information requested by the Commission during the year.

ORGANIZATION.

The methods of collecting and compiling the data for publication in the Annual Stream Measurement report were similar to those of previous years and have been described fully in other reports.

The division of the territory covered by the survey into districts in 1914, and described in Water Resources Paper No. 14, was found to be suitable and economical and was adhered to in 1915, but the changes in staff due to the war, made it impossible to allot an engineer specially to each district.

At the commencement of the year the staff consisted of the chief engineer, three division engineers, eight assistant engineers, one accountant, two clerical assistants and two stenographers. During the year six of the staff enlisted for active service and only three appointments were made. It is considered that, under the circumstances, the best possible rearrangement of the work was made.

Coast Division.

As in 1914 Messrs. Cline, Webb and Hughes were in charge of the field work in the Southern, Vancouver Island and Lillooet districts respectively. In September Mr. Cline was transferred to Kamloops to take charge of the Kamloops division when Mr. Dann enlisted for active service. For the remainder of the year what little field work was required in the southern district was looked after by Mr. Hughes.

The computations of the data for the Annual report were made by Messrs. Webb and Hughes and checked by Mr. Balls, the office engineer.

Coast Division. List of Regular Gauging Stations, Southern District.

Station Number.	Stream.	Location.
1000	Belknap	Tp. 6, Rge. 7, W. 7 M.
1063	Belknap	Tp. 7, Rge. 7, W. 7 M.
1001	Boulder	Tp. 3, Rge. 27, W. 6 M.
1021	Brandt	Tp. 7, Rge. 7, W. 7 M.
1023	Capilano	Near North Vancouver.
1003	Chehalis	Tp. 4, Rge. 30, W. 6 M.
1004	Chilliwack	Tp. 23, E. C. M.
1005	Coquihalla	Tp. 5, Rge. 26, W. 6 M.
1066	Coquitlam	Tp. 39, W. C. M.
1062	Flume	Six miles from head of Burrard Inlet.
1007	Fraser	Tp. 5, Rge. 26, W. 6 M.
1064	Hixon	Tp. 6, Rge. 7, W. 7 M.
1010	Jones	Tp. 3, Rge. 27, W. 6 M.
1046	Lynn	Near North Vancouver.
1011	Mesliloet	Tp. 7, Rge. 7, W. 7 M.
1058	Nicolum	Tp. 4, Rge. 5, W. 6 M.
1013	Norton	Tp. 7, Rge. 7, W. 7 M.
1022	Seymour	Near North Vancouver.
1017	Silver-Pitt	Tp. 4, Rge. 5, W. 7 M.
1055	Skagit	Forty miles south from Hope.
1018	South Lillooet	Tp. 12, E. C. M.
1056	Sumallo	Near Railway Belt boundary.
1057	Sumallo	Tp. 3, Rge. 24, W. 6 M.
1020	Young	Tp. 7, Rge. 7, W. 7 M.

Note:—All stations in Provincial Water District No. 1.

Except for the establishment of the station on Flume creek and the discontinuance of the stations on Black and Slollicum creeks, where the gauge readings were so infequent as to render the records of little value, no changes were made in the district during 1915.

The majority of the stations in the district have been established at the request of parties interested in the flow records, and in several cases they are co-operating with the department in the matter of expenditures in connection with the maintenance of the stations.

Open water conditions prevail on the majority of the rivers in the district, and as the conditions governing the control are for the most part permanent, the field work in connection with the maintenance of the stations is becoming less each year, now that the stations are well rated.

Coast Division. List of Regular Gauging Stations, Lillooet District.

Station Number.	Stream.	Location.
1065	Brandywine	Near Brew—One mile above mouth.
1045	Bridge	Ten miles from Shalaith—Thirty miles above mouth.
1048	Cayuse	Near Lillooet—Above Seton creek.
1034	Cheakamus	Near Cheekye.
1074	Foster Bar	Twenty-three miles south from Lillooet.
1047	Fountain	Near Lillooet—One mile above mouth.
1072	Fraser	At Lillooet.
1035	Green	Near Pemberton—Above Nairn falls.
1050	Laluwissin	Sec. 30, Tp. 27, Rge. 17, W. 6 M.
1038	Lillooet	Near Pemberton.
1073	Pavilion	Near Pavilion.
1049	Seton	Near Lillooet—Below Seton lake.
1061	Sixmile	At mouth, near Tisdale, B.C.
1037	Soo	One mile above mouth, near Tisdale.
1044	Texas	Fourteen miles south from Lillooet.

Note:—All stations in Provincial Water District No. 1.

In addition to maintaining the stations established in this district prior to 1915, others were established on Brandywine, Foster Bar, Fraser and Pavilion rivers.

While the minimum discharge of Brandywine river is rather small, about 600 horse power could be developed very cheaply and used as a temporary power plant until a larger development on the Cheakamus river is required.

The stations on Foster Bar and Pavilion creeks have been established in connection with irrigation studies. The Fraser river benches adjacent to the mouth of Foster Bar creek, when irrigated, are well suited to cultivation. At present the normal flow of the creek is being used for this purpose. So far no investigations have been made with a view to storing the high water flow. A small dam at the outlet of Pavilion lake stores a portion of the spring and early summer freshets and this water is released as required by the irrigators along the river.

Owing to the old gauge on the Fraser river at Lytton being affected by backwater from the Thompson river, the station was abandoned and a new station established at Lillooet, where measurements are secured from the Pacific Great Eastern Railway bridge.

Coast Division. List of Regular Gauging Stations, Vancouver Island District.

Station Number.	Stream.	Location.
1032	Big Qualicum	One and a half mile above mouth.
1042	Campbell	At Campbell lake.
1027	Chemainus	One mile above mouth, near Chemainus.
1054	Cowichan	At Cowichan lake.
1030	Englishmans	One and one-half mile above mouth, near Parksville.
1029	Haslam	Two miles above mouth, near Ladysmith.
1026	Koksilah	Two miles above mouth, near Duncan.
1031	Little Qualicum	At Cameron lake, B.C.
1028	Nanaimo	Six miles above mouth.
1040	Oyster	One mile above mouth.
1036	Puntledge	One mile above mouth, near Courtenay.
1063	Puntledge	Diversion dam, above Canadian Collieries Power Plant.
1025	Shawnigan	At Shawnigan lake, Koenigs, B.C.
1051	Sproat	At Sproat lake.
1052	Stamp	At Great Central lake.
1053	Stamp	One-half mile above Stamp falls.
1039	Tsolum	Three miles above mouth, near Courtenay.

Note:—All stations in Provincial Water District No. 1.

Stations were established in 1914 on those rivers which were considered of the most importance and with the exception of the station on Campbell river no change was made in the district during 1915.

Owing to the difficulty in securing accurate measurements from a boat, during high water on the Campbell river, a cable and car were installed in May and the station was fairly well rated during the season. The Campbell River Power Company co-operated in the matter of expenditure in the installation of cable and car.

Although the Campbell River Power Company was in possession of the daily gauge records of four gauges on the river since 1910, none of these gauges had ever been rated. These records were placed at the disposal of this survey and each set has been co-related to its gauge, affording an unbroken record of reliable data since the above mentioned year.

Coast Division. List of Miscellaneous Gauging Stations.

SOUTHERN DISTRICT.

Name.	Location.	
Black	Howe sound	Prov. Water Dist. No. 1.
Bridalveil	Tp. 5, Rge. 26, W. 6 M	Prov. Water Dist. No. 1.
Dunville	Tp. 2, Rge. 29, W. 6 M	Prov. Water Dist. No. 1.
Elk	Tp. 2, Rge. 29, W. 6 M	Prov. Water Dist. No. 1.
Elk	Tp. 2, Rge. 29, W. 6 M	Prov. Water Dist. No. 1.
Hutchison	Tp. 2, Rge. 29, W. 6 M	Prov. Water Dist. No. 1.
Jackman	Tp. 2, Rge. 29, W. 6 M	Prov. Water Dist. No. 1.
Slollicum	Tp. 5, Rge. 28, W. 6 M	Prov. Water Dist. No. 1.

LILLOOET DISTRICT.

Island Bar	Near Lillooet....Prov. Water Dist. No. 1.
Riley	Near Lillooet, above irrigation ditches....Prov. Water Dist. No. 1.
Swartz	Nineteen miles south from Lillooet....Prov. Water Dist. No. 1.

VANCOUVER ISLAND DISTRICT.

Browne	Three miles above mouth, near Courtenay..Prov. Water Dist. No. 1.
Holt	C.N.P. Ry. bridge, near Duncans....Prov. Water Dist. No. 1.
Millard	Near Courtenay....Prov. Water Dist. No. 1.
Nanaimo, south fork	Near mouth, twelve miles from Nanaimo...Prov. Water Dist. No. 1.
Quinsam	One-half mile above mouth, near Campbell river, B.C....Prov. Water Dist. No. 1.

KAMLOOPS DIVISION.

The number of changes in the staff of the Kamloops division due to the men enlisting for active service overseas, has made the field and office work exceedingly heavy for the remaining staff. For the greater part of the year the field work in the three districts of the division was carried on by two engineers.

The computations of the data for the annual report were made by Messrs. Tredcroft and McNaughton and checked by the division engineer.

Kamloops Division. List of Regular Gauging Stations, Kamloops District.

Station Number.	Stream.	Location.
2084	Barriere	Near Barriere....Prov. Water Dist. No. 2.
2002	Bolean	Tp. 18, Rge. 12, W. 6 M....Prov. Water Dist. No. 2.
2004	Campbell	Tp. 19, Rge. 16, W. 6 M....Prov. Water Dist. No. 2.
2005	Cherry	Tp. 19, Rge. 19, W. 6 M....Prov. Water Dist. No. 2.
2047	Clearwater	Near Raft river....Prov. Water Dist. No. 2.
2082	Edwards	Tp. 22, Rge. 16, W. 6 M....Prov. Water Dist. No. 2.
2083	Edwards, Lyons diversion	Tp. 22, Rge. 16, W. 6 M....Prov. Water Dist. No. 2.
2014	Guichon	Near Mamit lake....Prov. Water Dist. No. 3.
2019	Heffley, below Heffley lake	Tp. 22, Rge. 16, W. 6 M....Prov. Water Dist. No. 2.
2018	Heffley, above diversions, near mouth	Tp. 22, Rge. 17, W. 6 M....Prov. Water Dist. No. 2.
2020	Ingram	Tp. 17, Rge. 13, W. 6 M....Prov. Water Dist. No. 2.
2022	Jamieson	Tp. 22, Rge. 17, W. 6 M....Prov. Water Dist. No. 2.
2056	Little Clearwater	Near Raft river....Prov. Water Dist. No. 2.
2023	Louis	Tp. 23, Rge. 15, W. 6 M....Prov. Water Dist. No. 2.
2025	Monte, below diversion to Summit lake	Tp. 18, Rge. 14, W. 6 M....Prov. Water Dist. No. 2.
2024	Monte, above Bostocks diversion	Tp. 19, Rge. 15, W. 6 M....Prov. Water Dist. No. 2.
2069	Murtle	Near Raft river....Prov. Water Dist. No. 2.
2085	North Thompson	Near Barriere....Prov. Water Dist. No. 2.
2032	Paul	Tp. 20, Rge. 16, W. 6 M....Prov. Water Dist. No. 2.
2055	Raft	Near Raft river....Prov. Water Dist. No. 2.
2078	Salmon	Tp. 18, Rge. 12, W. 6 M....Prov. Water Dist No. 2.
2058	Siwash	Tp. 22, Rge. 16, W. 6 M....Prov. Water Dist. No. 2.
2080	Threemile	Tp. 20, Rge. 21, W. 6 M....Prov. Water Dist. No. 2.
2043	Tranquille	Tp. 20, Rge. 19, W. 6 M....Prov. Water Dist. No. 2
2066	Whitewood	Near Barriere....Prov. Water Dist. No. 2

The stream measurement work in the Kamloops district is principally on irrigation streams where the frequent shortage of water demands accurate gauging so that the apportioning of water to the various users may be efficiently done.

In establishing and maintaining these stations the requirements of the Water Rights Branch of the Provincial Government are very closely followed.

The stations on Edwards creek and Salmon river, which had been discontinued, were re-established in 1915 at the request of the Water Rights Branch.

On the Barriere, Clearwater, Murtle, Little Clearwater and Raft rivers the stations are maintained in connection with water power projects.

The city of Kamloops has a small power plant in operation at the present time on the Barriere river.

The splendid opportunities for the development of power on the Murtle river warranted the establishment of an automatic water stage register and a cable car to ensure frequency of gauge records and accuracy of meter measurements.

On the North Thompson a station was established on the new highway bridge near Barriere, as the old station above Jamieson creek was found to be expensive and difficult to maintain.

Kamloops Division. List of Regular Gauging Stations, Okanagan District.

Station Number.	Stream.	Location.
2000	Adams	Tp. 23, Rge. 12, W. 6 M. Prov. Water Dist. No. 2.
2048	Boundary	At Greenwood. Prov. Water Dist. No. 5.
2070	Brash	Tp. 18, Rge. 8, W. 6 M. Prov. Water Dist. No. 2.
2073	Chase	Tp. 21, Rge. 13, W. 6 M. Prov. Water Dist. No. 2.
2051	Crazy	Tp. 23, Rge. 5, W. 6 M. Prov. Water Dist. No. 2.
2010	Eagle	Tp. 23, Rge. 6, W. 6 M. Prov. Water Dist. No. 2.
2064	Granite	Near Coalmont. Prov. Water Dist. No. 4.
2052	Kettle, north fork	At Grand forks. Prov. Water Dist. No. 5.
2045	Kettle, west fork	Near Westbridge. Prov. Water Dist. No. 5.
2046	Kettle, Nicholsons bridge	Near Kettle valley. Prov. Water Dist. No. 5.
2049	Kettle, Carson	At Carson. Prov. Water Dist. No. 5.
2074	Manson	Tp. 23, Rge. 10, W. 6 M. Prov. Water Dist. No. 2.
2031	Niskonlith	Tp. 21, Rge. 13, W. 6 M. Prov. Water Dist. No. 2.
2088	Okanagan	At Okanagan falls. Prov. Water Dist. No. 4.
2077	Ross	Tp. 23, Rge. 9, W. 6 M. Prov. Water Dist. No. 2.
2079	Scotch	Tp. 23, Rge. 11, W. 6 M. Prov. Water Dist. No. 2.
2061	Seymour	Head of Seymour arm, Shuswap lake. Prov. Water Dist. No. 2.
2034	Shuswap	Tp. 18, Rge. 9, W. 6 M. Prov. Water Dist. No. 2.
2054	Similkameen	Near Ashnola. Prov. Water Dist. No. 4.
2063	South Similkameen	At Princeton. Prov. Water Dist. No. 4.
2042	South Thompson	Tp. 21, Rge. 13, W. 6 M. Prov. Water Dist. No. 2.
2062	Tulameen	At Coalmont. Prov. Water Dist. No. 5.
2081	Twentymile	Near Hedley. Prov. Water Dist No. 4.

Chase, Manson and Niskonlith creeks are used for irrigation.

In this district a number of other irrigation streams which are outside the Dominion railway belt are being measured by the Provincial Water Rights Branch.

Records are being kept on Brash creek in co-operation with the city of Enderby for municipal water supply and power purposes.

Most of the other stations in the Okanagan district are maintained on account of water power possibilities.

On Adams river a Gurley water stage register has been in operation all year and the results have been most satisfactory. No ice troubles were experienced although the weather was unusually cold.

A car and cable were installed in April, 1915, on the Seymour river and the station was consequently fairly well rated during the season, so that the gauge readings obtained in 1914 as well as those in 1915 were made available for determining the flow of the stream.

The car on the Seymour river is located on one of the trails up the river and is used as a ferry by ranchers and others who have occasion to use the trail. A similar use is made of the car on the Murtle river, in the Kamloops district, particularly by the rangers of the Provincial Forestry Department.

Kamloops Division. List of Regular Gauging Stations, Ashcroft District.

Station Number.	Stream.	Location.	
2001	Barnes	Tp. 20, Rge. 24, W. 6 M	Prov. Water Dist. No. 2.
2069	Beaver	North of Nicola lake	Prov. Water Dist. No. 3.
2003	Bonaparte	Tp. 21, Rge. 24, W. 6 M	Prov. Water Dist. No. 2.
2071	Cache	Tp. 21, Rge. 24, W. 6 M	Prov. Water Dist. No. 2.
2072	Cache, diversion to Eightmile	Tp. 22, Rge. 24, W. 6 M	Prov. Water Dist. No. 2.
2006	Coldwater	At Merritt	Prov. Water Dist. No. 3.
2007	Criss	Tp. 22, Rge. 22, W. 6 M	Prov. Water Dist. No. 2.
2008	Deadman	Tp. 22, Rge. 22, W. 6 M	Prov. Water Dist. No. 2.
2016	Hat	Tp. 19, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
2027	Nahatlatch	Tp. 12, Rge. 26, W. 6 M	Prov. Water Dist. No. 1.
2030	Nicola, mouth	Tp. 17, Rge. 25, W. 6 M	Prov. Water Dist. No. 3.
2029	Nicola, Merritt	At Merritt	Prov. Water Dist. No. 3.
2075	Nicola, Nicola	At Nicola	Prov. Water Dist. No. 3.
2086	Nicola, above Nicola lake	East of Nicola lake	Prov. Water Dist. No. 3.
2037	Spius	Tp. 13, Rge. 23, W. 6 M	Prov. Water Dist. No. 3.
2039	Thompson, Spences bridge	Tp. 17, Rge. 25, W. 6 M	Prov. Water Dist. No. 3.

Most of the streams in the Ashcroft district are used for irrigation purposes and the stations on them are only maintained during the irrigation season.

New stations were established on Beaver creek and on the Nicola river, above Nicola lake, at the request of the Provincial Water Rights Branch.

The station on Nicola river, at Nicola, which was established by the Provincial Water Rights Branch in 1913, was transferred to the British Columbia Hydrometric Survey in 1915.

On Cache creek the station had been discontinued, but, at the request of the Provincial Water Rights Branch, it was started again in 1915.

Kamloops Division. List of Miscellaneous Gauging Stations,

KAMLOOPS DISTRICT.

Name	Location.	
Alkali creek	Tp. 19, Rge. 19, W. 6 M	Prov. Water Dist. No. 2.
Anstey creek	Tp. 25, Rge. 7, W. 6 M	Prov. Water Dist. No. 2.
Battle creek	Near Raft river	Prov. Water Dist. No. 2.
Bear creek	Tp. 23, Rge. 12, W. 6 M	Prov. Water Dist. No. 2.
Bear creek, diversion from	Tp. 23, Rge. 12, W. 6 M	Prov. Water Dist. No. 2.
Bear creek	Near Raft river	Prov. Water Dist. No. 2.
Cahilty creek	Tp. 23, Rge. 15, W. 6 M	Prov. Water Dist. No. 2.
Canoe creek	Tp. 20, Rge. 9, W. 6 M	Prov. Water Dist. No. 2.
Chartrand creek	Tp. 17, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.
Chartrand spring	Tp. 17, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.
Christian creek	Tp. 22, Rge. 15, W. 6 M	Prov. Water Dist. No. 2.
Cold creek	Tp. 20, Rge. 16, W. 6 M	Prov. Water Dist. No. 2.
Dairy creek	Tp. 20, Rge. 19, W. 6 M	Prov. Water Dist. No. 2.
Duffy creek	Tp. 20, Rge. 20, W. 6 M	Prov. Water Dist. No. 2.
Edwards creek, near mouth	Tp. 22, Rge. 16, W. 6 M	Prov. Water Dist. No. 2.
Fadear creek	Tp. 24, Rge. 15, W. 6 M	Prov. Water Dist. No. 2.
Fishtrap creek	Thirty-five miles north of Kamloops	Prov. Water Dist. No. 2.
Fraser river	Tp. 15, Rge. 27, W. 6 M	Prov. Water Dist. No. 1.
Gold creek	Tp. 23, Rge. 12, W. 6 M	Prov. Water Dist. No. 2.
Greenstone creek	Tp. 17, Rge. 20, W. 6 M	Prov. Water Dist. No. 3.
Grouse creek	Near Raft river	Prov. Water Dist. No. 2.
Guichon creek, above Witch creek	Tp. 18, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.
Guichon creek, below Allens house	Tp. 18, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.
Heffley creek, Andersons diversion	Tp. 22, Rge. 16, W. 6 M	Prov. Water Dist. No. 2.
Heffley creek, Austins diversion	Tp. 22, Rge. 17, W. 6 M	Prov. Water Dist. No. 2.
Heffley creek, Crawshaws diversion	Tp. 22, Rge. 16, W. 6 M	Prov. Water Dist. No. 2.
Hemp creek	Near Raft river	Prov. Water Dist. No. 2.
Hermon spring	Near Raft river	Prov. Water Dist. No. 2.
Louis creek, at mouth	Louis creek	Prov. Water Dist. No. 2.
McGillivary creek	Tp. 22, Rge. 15, W. 6 M	Prov. Water Dist. No. 2.
Meadow creek	Tp. 17, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.
Meadow creek	Tp. 23, Rge. 10, W. 6 M	Prov. Water Dist. No. 2.
Monte creek, diversion to Summit lake	Tp. 18, Rge. 14, W. 6 M	Prov. Water Dist. No. 2.
Pendleton creek	Tp. 19, Rge. 19, W. 6 M	Prov. Water Dist. No. 2.
Peterson creek	Tp. 19, Rge. 17, W. 6 M	Prov. Water Dist. No. 2.
Queest creek	Tp. 24, Rge. 7, W. 6 M	Prov. Water Dist. No. 2.
Quenville creek	Tp. 17, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.
Quelchena creek	At Quelchena	Prov. Water Dist. No. 3.
Ray creek	Below Mamit lake	Prov. Water Dist. No. 3.
Robbins creek	Tp. 19, Rge. 15, W. 6 M	Prov. Water Dist. No. 2.
Salmon river	Tp. 20, Rge. 10, W. 6 M	Prov. Water Dist. No. 2.
Sullivan creek	Tp. 23, Rge. 16, W. 6 M	Prov. Water Dist. No. 2.
Threemile creek, Savona road	Tp. 20, Rge. 21, W. 6 M	Prov. Water Dist. No. 2.
Threemile creek, south-east fork	Tp. 19, Rge. 20, W. 6 M	Prov. Water Dist. No. 2.
Threemile creek, south-west fork	Tp. 19, Rge. 20, W. 6 M	Prov. Water Dist. No. 2.
Witch creek	Tp. 18, Rge. 21, W. 6 M	Prov. Water Dist. No. 3.

OKANAGAN DISTRICT.

Name	Location.	
Ashnola creek	Keremeos	Prov. Water Dist. No. 4.
Otter river	Tulameen	Prov. Water Dist. No. 4.
Nicholsons creek	Nicholsons bridge	Prov. Water Dist. No. 4.
Rock creek	Rock creek	Prov. Water Dist. No. 4.

ASHCROFT DISTRICT.

Anderson creek	Tp. 20, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Blue Earth creek	Tp. 19, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Clemes creek	Tp. 22, Rge. 22, W. 6 M	Prov. Water Dist. No. 2.
Colley creek	Tp. 19, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Collins diversion from Bonaparte river	Tp. 21, Rge. 24, W. 6 M	Prov. Water Dist. No. 2.
Hammonds diversion from Hat creek	Tp. 19, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Hammonds diversion from Oregon Jack creek	Tp. 19, Rge. 25, W. 6 M	Prov. Water Dist. No. 2.
Hat creek	Tp. 22, Rge. 25, W. 6 M	Prov. Water Dist. No. 2.
King creek	Tp. 19, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Lloyd creek	Tp. 20, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Log lake creek	Tp. 22, Rge. 23, W. 6 M	Prov. Water Dist. No. 2.
Medicine creek	Tp. 21, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Nelson creek	Tp. 20, Rge. 24, W. 6 M	Prov. Water Dist. No. 2.
Oregon Jack creek	Tp. 19, Rge. 25, W. 6 M	Prov. Water Dist. No. 2.
Robertson creek	Tp. 22, Rge. 26, W. 6 M	Prov. Water Dist. No. 2.
Scottie creek	Tp. 23, Rge. 25, W. 6 M	Prov. Water Dist. No. 2.
Walhachin diversion from Deadman river	Tp. 22, Rge. 22, W. 6 M	Prov. Water Dist. No. 2.

Kamloops Division. Water Level Stations, 1915.

Station Number.	Stream.	Location.	
2086	Christina	Near Grand Forks	Prov. Water Dist. No. 5.
2087	Shuswap	Tp. 21, Rge. 8, W. 6 M	Prov. Water Dist. No. 2.
2040	Thompson, Kamloops	Tp. 20, Rge. 17, W. 6 M	Prov. Water Dist. No. 2.

NELSON DIVISION.

In the Nelson division, as in the Coast and Kamloops divisions, two engineers carried on the field work in the three districts after 30th June, when Mr. Elliott was transferred to the Fort George district to replace Mr. Chisholm, who enlisted for active service.

The computations of the data for the annual report were made by Messrs. Dempster and Beeston and checked by the division engineer.

Nelson Division. List of Regular Gauging Stations, Nelson District.

Station Number.	Stream.	Location.	
3025	Carpenter	Near Sandon	Prov. Water Dist. No. 6.
3004	Columbia	Near Castlegar	Prov. Water Dist. No. 6.
3008	Columbia	Near Trail	Prov. Water Dist. No. 6.
3066	Duncan	Near Howser	Prov. Water Dist. No. 6.
3070	Fry	Near Johnstons Landing	Prov. Water Dist. No. 6.
3071	Glacier	Near Howser	Prov. Water Dist. No. 6.
3031	Goat	Near Erickson	Prov. Water Dist. No. 6.
3084	Inonoaklin	Near Edgewood	Prov. Water Dist. No. 6.
3029	Kaslo	Near Kaslo	Prov. Water Dist. No. 6.
3022	Kooskanax	Near Nakusp	Prov. Water Dist. No. 6.
3075	Kootenay	Near Bonnington Falls	Prov. Water Dist. No. 6.
3014	Kootenay	Near Glade	Prov. Water Dist. No. 6.
3077	Kootenay	Near Nelson	Prov. Water Dist. No. 6.
3017	Pend d'Oreille	Near Waneta	Prov. Water Dist. No. 6.
3027	Silverton, below mill	Near Silverton	Prov. Water Dist. No. 6.
3028	Silverton, above mill	Near Silverton	Prov. Water Dist. No. 6.
3018	Slocan	Near Crescent Valley	Prov. Water Dist. No. 6.

The station on the Inonoaklin river, established for the study of flow data in connection with a proposed water supply for the town of Edgewood, is the only new station established during the year.

On Nakusp and Sawmill rivers, the stations have been discontinued, the data not being deemed of sufficient importance to warrant the expenditure required to maintain them.

Owing to the difficulty in securing reliable gaugings on the Pend d'Oreille, at Waneta, the division engineer accompanied by Messrs. Hoyt and Parker of the United States Geological Survey, made a reconnaissance trip along the course of the river. The most suitable location for establishing a station was found to be near Metaline Falls, Washington. The station at Waneta was consequently discontinued and we have co-operated with the United States Geological Survey in the establishment of a cable and car at Metaline Falls, and in the maintenance of the station. The Survey's station on the Columbia river, at Trail, was also visited and the United States Geological Survey in turn have co-operated with us in its maintenance. A sounding apparatus, weights and reel, have been sent by Mr. Hoyt for use at Trail during high water, as difficulty has previously been experienced in getting soundings at high stages with ordinary weights.

Nelson Division. List of Regular Gauging Stations, Revelstoke District.

Station Number.	Stream.	Location.	
3000	Akokolex	Tp. 22, Rge. 1, W. 6 M	Prov. Water Dist. No. 8.
3002	Blaeberry	Tp. 28, Rge. 22, W. 5 M	Prov. Water Dist. No. 8.
3003	Bugaboo	Near Spillimacheen	Prov. Water Dist. No. 8.
3005	Columbia, Golden	Tp. 27, Rge. 22, W. 5 M	Prov. Water Dist. No. 8.
3007	Columbia, Revelstoke	Tp. 23, Rge. 2, W. 6 M	Prov. Water Dist. No. 8.
3062	Field Springs, No. 1	Tp. 28, Rge. 18, W. 5 M	Prov. Water Dist. No. 8.
3063	Field Springs, No. 2	Tp. 28, Rge. 18, W. 5 M	Prov. Water Dist. No. 8.
3064	Field Springs, No. 3	Tp. 28, Rge. 18, W. 5 M	Prov. Water Dist. No. 8.
3036	Findlay	Near Thunder hill	Prov. Water Dist. No. 8.
3053	Hospital, weir	Tp. 27, Rge. 22, W. 5 M	Prov. Water Dist. No. 8.
3009	Illecillewaet, Revelstoke	Tp. 23, Rge. 2, W. 6 M	Prov. Water Dist. No. 8.
3030	Incomappleux	Near Beaton	Prov. Water Dist. No. 8.
3011	Kicking Horse, Golden	Tp. 27, Rge. 22, W. 5 M	Prov. Water Dist. No. 8.
3012	Kicking Horse, Field	Tp. 28, Rge. 18, W. 5 M	Prov. Water Dist. No. 8.
3013	Kicking Horse, No. 2 tunnel	Tp. 28, Rge. 18, W. 5 M	Prov. Water Dist. No. 8.
3015	No. 2	Near Wilmer	Prov. Water Dist. No. 8.
3019	Spillimacheen	Near Spillimacheen	Prov. Water Dist. No. 8.
3020	Toby	Near Athalmer	Prov. Water Dist. No. 8.
3032	North Vermilion	Near Edgewater	Prov. Water Dist. No. 8.
3033	South Vermilion	Near Edgewater	Prov. Water Dist. No. 8.
3054	Washout	Near Galena	Prov. Water Dist. No. 8.

The station on Beaver river has been maintained for several years, but as it is not considered of sufficient importance to warrant carrying on further work at this time, the station has been discontinued.

The shifting conditions on Canyon, Illecillewaet, near Glacier, Salmon, Shuswap, Stoddart and Windermere rivers rendered it impossible to secure data sufficiently reliable to compute the daily discharges. The rivers are returned in the Annual Stream Measurement Report under the caption "Miscellaneous" and only the actual meter measurements are given.

With the above exceptions the district is the same as in 1914.

Nelson Division. List of Regular Gauging Stations, Cranbrook District.

Station Number.	Stream.	Location.
3039	Bull	Near Bull river. Prov. Water Dist. No. 7.
3038	Cherry	Near Wasa. Prov. Water Dist. No. 7.
3048	Elk	Near Elko. Prov. Water Dist. No. 7.
3047	Gold	Near Newgate. Prov. Water Dist. No. 7.
3041	Kootenay	Near Wardner. Prov. Water Dist. No. 7.
3045	Linklater	Near Newgate. Prov. Water Dist. No. 7.
3037	Mark	Near Marysville. Prov. Water Dist. No. 7.
3056	Moyie	Near Kingsgate. Prov. Water Dist. No. 7.
3046	Phillips	Near Roosville. Prov. Water Dist. No. 7.
3049	Rock	Near Elko. Prov. Water Dist. No. 7.
3042	Big Sand	Near Jaffray. Prov. Water Dist. No. 7.
3043	Little Sand	Near Jaffray. Prov. Water Dist. No. 7,
3050	St. Marys	Near Wycliffe. Prov. Water Dist. No. 7.

With the exception of the discontinuance of Mud creek no other change has been made in the district since 1914.

This district was not extended during the year as we had hoped, the number of men enlisting for active service made it impossible to look after any more work than in 1914. Measurements were obtained, however, at stages suitable for improving the curves, and ice measurements were secured on streams with power possibilities.

Nelson Division. List of Miscellaneous Gauging Stations.

NELSON DISTRICT.

Stream.	Location.
Eagle creek	Near Edgewood. Prov. Water Dist. No. 6.
Giveout creek	Near Nelson. Prov. Water Dist. No. 6.
Hall creek	Near Halls siding. Prov. Water Dist. No. 6.
Whatshan creek, above Barnes	Near Needles. Prov. Water Dist. No. 6.
Whatshan creek, below Barnes	Near Needles. Prov. Water Dist. No. 6.
Cariboo creek	Near Burton City. Prov. Water Dist. No. 6.
Carpenter creek	Near New Denver. Prov. Water Dist. No. 6.
Lardeau river	Near Howser. Prov. Water Dist. No. 6.
Slocan river	Near Slocan City. Prov. Water Dist. No. 6.
Wilson creek	Near Roseberry. Prov. Water Dist. No. 6.

REVELSTOKE DISTRICT.

Stream.	Location.
Horsethief creek	Near Wilmer. Prov. Water Dist. No. 8.
Illecillewaet river	Near Glacier. Prov. Water Dist. No. 8.
Salmon river	Near Beaton. Prov. Water Dist. No. 8.
Shuswap creek	Near Athalmer. Prov. Water Dist. No. 8.
Stoddart creek	Near Athalmer. Prov. Water Dist. No. 8.
Sinclair creek	Near Radium Hot Springs. Prov. Water Dist. No. 8.
Windermere river	Near Windermere. Prov. Water Dist. No. 8.

CRANBROOK DISTRICT.

Stream.	Location.
Cedar creek	Near Ainsworth. Prov. Water Dist No. 7.
Hammill creek	Near Argenta. Prov. Water Dist. No. 7.
Woodbury creek	Near Ainsworth. Prov. Water Dist. No. 7.

FORT GEORGE DISTRICT.

The completion of the Grand Trunk Pacific Railway has opened up a large portion of central British Columbia for settlement and development, and the requests received for run-off data in connection with proposed power development and municipal water supply, have made it necessary that work should be commenced in this district.

The shortage of funds has prevented us from thoroughly covering the entire district at this time, but stations have been established on the most important streams for which requests for data have been received.

Fort George District. List of Regular Gauging Stations.

Station Number.	Stream.	Location.
4004	Bulkley, Hazelton...	Three-quarters mile from Old Hazelton, B.C.
4003	Bulkley, Hubert.....	At highway bridge, near Hubert, B.C.
4002	Dore................	Grand Trunk Pacific Railway bridge, near McBride, B.C.
4000	Nechako, Ft. Fraser....	Grand Trunk Pacific Railway bridge, near Fort Fraser townsite.
4006	Nechako, Vanderhoof..	One-half mile from Vanderhoof, B.C.
4005	Skeena, Hazelton......	At ferry.—Old Hazelton, B.C.

In addition to the foregoing list, stations were established on the Stoney and Nautley rivers. The station on Stoney creek, which was established to ascertain the possibility of obtaining power for the town of Vanderhoof, was discontinued, owing to a land slide diverting the bulk of the water into another drainage area. The Nautley river, on which the station was established in connection with a proposed water development, was abandoned; a test of the water showing it to be unfit for this purpose.

Fort George District. List of Miscellaneous Gauging Stations.

Stream.	Location.
Bulkley river..........	Smithers.
Chilako river..........	Millers ranch, near South Fort George.
Dome creek..........	Mile 145, B.C. (G.T.P. Ry.).
Fraser river..........	Mile 145, B.C. (G.T.P. Ry.).
Nautley river..........	Fort Fraser.
Stoney creek..........	Vanderhoof.

EXPLANATION OF TABLES.

For each regular gauging station the following data are given so far as available:—

1. Description of station.
2. Table of discharge measurements.
3. Daily gauge-height discharge table.
4. Tables of monthly discharge and run-off.

Under the description of stations is given the location, general information regarding the equipment, and the time the station has been maintained. Regarding stations established this year, is given briefly, the source, description of drainage area, and present uses of the river. In addition, the description covers ice conditions and their effect on the relation of gauge height to discharge.

The table of discharge measurements gives the number of measurements made during the year, the date measurement was made, name of engineer, the width and area of the cross section and the discharge in cubic feet per second. The zero of the gauge is set to an arbitrary datum, and has no relation to the zero flow or bed of the river. In general, the zero is located below the lowest known flow.

The daily gauge-height discharge tables give the daily elevation of the surface of the river above the zero of the gauge, and the daily discharge in cubic feet per second for the observed gauge height.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gauge height was highest. As the gauge height is the mean for the day, there may have been short periods when the gauge height and corresponding discharge was higher than given in this column. Likewise in the column of "Minimum" the quantity given is the mean flow for the day when the mean gauge height was lowest. The column headed "Mean" is the average flow for each second during the month. On this the computations for the remaining columns are based.

DEFINITIONS OF TERMS.

The volume of water flowing in a stream called the run-off or "discharge" is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups: (1) those which represent a rate of flow, as second-feet, gallons per minute, and run-off in second feet per square mile; and (2) those which represent the actual quantity of water, as run-off in depth in inches and acre feet.

The units used in this report are, second-feet, second-feet per square mile, run-off in inches, and acre-feet.

"Second-foot" is an abbreviation for cubic foot per second (c. f. s.) and is the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the following table of equivalents.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

"Acre-foot is equivalent to 43,560 cubic feet, and is the quantity required to cover an acre to the depth of 1 foot. It is a common unit of measurement of quantity, and is generally used in connection with storage.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:—

1 second-foot equals 35.71 British Columbia miner's inches.

1 second-foot equals 6.23 British Imperial gallons per second; equals 538,472 gallons for one day.

1 second-foot equals 7.48 United States gallons per second; equals 646,272 gallons for one day.

1 second-foot for one year covers 1 square mile, 1.131 feet or 13.572 inches deep.

1 second-foot for one year equals 31,536,000 cubic feet; equals 724 acre-feet.

1 second-foot equals about 1 acre-inch per hour.

1 second-foot for one day equals 86,400 cubic feet; equals 1.983 acre-feet.

1 second-foot for one 28 day month equals 55.52 acre-feet.

1 second-foot for one 29 day month equals 57.50 acre-feet.

1 second-foot for one 30 day month equals 59.48 acre-feet.

1 second-foot for one 31 day month equals 61.46 acre-feet.

1 second-foot for one 28 day month covers 1 square mile 1.041 inches deep.

1 second-foot for one 29 day month covers 1 square mile 1.079 inches deep.

1 second-foot for one 30 day month covers 1 square mile 1.116 inches deep.

1 second-foot for one 31 day month covers 1 square mile 1.153 inches deep.

100 British Imperial gallons per minute equals 0.268 second-feet.

100 United States gallons per minute equals 0.223 second-feet.

1,000,000 British Imperial gallons per day equals 1.86 second-feet.

1,000,000 United States gallons per day equals 1.55 second-feet.

1,000,000 British Imperial gallons equals 3.68 acre-feet.

1,000,000 United States gallons equals 3.07 acre-feet.

1,000,000 cubic feet equals 22.95 acre-feet.

1 acre-foot equals 43,560 cubic feet.

1 acre-foot equals 271,472 British imperial gallons.

1 acre-foot equals 325,850 United States gallons.

1 inch deep on 1 square mile equals 2,323,200 cubic feet.

1 inch deep on 1 square mile equals 0.0737 second-foot per year.

1 acre equals 43,560 square feet.
1 cubic foot equals 6.23 British imperial gallons.
1 cubic foot equals 7.48 United States gallons.
1 cubic foot of water weighs 62.4 pounds.
1 horse-power equals 550 foot-pounds per second.
1 horse-power equals 746 watts.
1 horse-power equals 1 second-foot falling 8.80 feet.

To calculate water power quickly:

$$\frac{\text{sec.-ft. x fall in feet}}{11} = \text{net horse-power on water wheel, realizing 80 per cent}$$

of theoretical power.

ACCURACY AND RELIABILITY OF DATA.

Practically all discharge measurements made under fair conditions are well within 5 per cent of the true discharge of the time of observation. Inasmuch as the errors of meter measurements are largely compensating, the mean rating curve, when well defined, is much more accurate than the individual measurements.

In order to give information regarding the probable accuracy of the computed results, an accuracy column is inserted in the monthly discharge table. Accuracy "A" indicates that the mean accuracy is probably accurate within 5 per cent; "B" within 10 per cent; "C" within 15 per cent; "D" within 15 to 25 per cent. Special conditions are covered by foot notes.

The accuracy in many cases is not as great as we would wish, the area covered is very large, and a large number of the stations have been maintained but a short time. Future observations may render necessary a certain amount of revision of the data here supplied.

The topographic surveys of the province are very incomplete, and the drainage areas are, in many cases, only approximate; consequently the figures showing discharge per square mile, and run-off depth in inches may be somewhat in error.

PUBLICATIONS.

The stream measurement work of this organization to date has been made available to the public in the following publications:—

Water Resources Paper No. 1.—Records to Dec. 31, 1912.
Water Resources Paper No. 8.—Records to Dec. 31, 1913.
Water Resources Paper No. 14.—Records to Dec. 31, 1914.
Water Resources Paper No. 18.—Records to Dec. 31, 1915.

ACKNOWLEDGMENTS.

I take pleasure in expressing my appreciation of the hearty co-operation of the different individuals and companies interested in stream flow in the province, particularly the following:—
The Westminster Power Company; Messrs. Anderson & Warden, Civil Engineers, Vancouver, B.C.; Mr. Fellows, City Engineer, Vancouver, B.C.; Mr. F. A. Easton, C.E., Assistant Engineer, Vancouver Power Co., Ltd.; Mr. Wallace Grime, Secretary, Campbell River Power Company, Victoria, B.C.; Mr. James Hunter, C.E., Chief Engineer, Canadian Collieries (Dunsmuir) Ltd; Mr. Wm. Young, C.E., Comptroller of Water Rights, Victoria, B.C.; The Hon. L. A. Campbell; Mr. Bulger, Nakusp; and the district engineers of the Water Rights Branch, Government of British Columbia.

The following publications have been made use of in the compilation of this report:—The Monthly Weather Review, by the Meteorological Service of the Department of Marine and Fisheries and certain memoirs issued by the Geological Survey of the Department of Mines.

REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER II.

REPORT OF C. E. WEBB, B.A.Sc.

ACTING DIVISION ENGINEER.

CHAPTER II.

COAST DIVISION.

TERRITORY.

Geography.—The Coast division of the British Columbia Hydrometric Survey comprises the south-western part of British Columbia. By referring to the key map showing the number and location of all the regular gauging stations, the exact boundaries may be clearly noted. All gauging stations numbering in the *One* Thousands are in the Coast division.

The Coast division is subdivided into three districts, known as Lillooet, Southern, and Vancouver Island. These districts were fully described in the 1914 report (Water Resources Paper No. 14.) Generally speaking, the Lillooet district extends along the line of the Pacific Great Eastern Railway from the head of Howe Sound to the vicinity of the town of Lillooet. The southern district comprises the territory around Vancouver, and extends up the valley of the Fraser river as far east as North Bend. Vancouver Island district is the whole of Vancouver Island, although as yet no work has been done on the north end or west coast.

The Coast division includes the large manufacturing centres of Greater Vancouver, New Westminster, and Victoria. These centres are supplied with electric energy by two large hydro-electric power companies, the Western Canada Power Company and the British Columbia Electric Railway Company.

Showing intake of Vancouver Water Supply.
Gauging section, Capilano creek, 10 feet above intake.

Moose falls, Campbell river.

Elk falls, Campbell river.
This is considered the best undeveloped water power on the British Columbia Coast.

Topography.—The topography of the Coast division varies to such a great extent that it is hard to discuss it with regard to the different drainages, except in a very general manner. Along the Fraser river from North Bend west, the topography changes from the high rugged mountains of the Coast range, with narrow bench lands, to the fertile low lands at the mouth of the river where the valley is wide. The great interior plateau with its semi-arid soil comes into the division in the vicinity of Lillooet. There is some fine agricultural land in this district which, when irrigated, yields excellent crops. To the west of Lillooet the mountains rise rapidly and precipitation increases. Vancouver Island has a mountainous interior and for the most part is very heavily timbered. The streams are comparatively short and swift, rising and falling rapidly with sudden changes in climatic conditions.

Economic Geology.—The mineral wealth in the division is very great and new properties are continually being opened up and developed. The present war has given a great impetus to the already active mining industry in this province and many companies are enlarging their plants, which will greatly increase their productions. Gold, silver, copper and coal are all mined extensively, while Portland cement is manufactured on a large scale on Vancouver Island.

Hydro-electric energy is used to a large extent in all mining operations in the Coast division, most mines having their own hydro-electric installations.

CLIMATE.

Temperature and Precipitation.—The climate of the south-western part of British Columbia is moderate. The warm Japan current which flows along the coast has a great effect on the climatic conditions of the province. Due to the mountainous nature of the country there is often a great difference in both temperature and precipitation in a very short distance. In the winter, precipitation is mostly caused by moisture-laden winds from the Pacific ocean. These winds frequently cross the low coastal plains without precipitating a drop of water, but on striking the cold mountain sides at a high altitude, the moisture is immediately condensed, causing heavy precipitation, probably in the form of snow on the mountains and rain in the valleys.

The snow stored in the higher altitudes during the winter comes off as a rule during May and June. The streams along the coast and on Vancouver Island are subject to high water almost any time from October to June. These streams usually have their minimum flow in the months of August and September. The inland streams in the southern and Lillooet districts being subject to lower temperatures in the winter months, generally have their minimum flow in January and February and their maximum flow in the spring.

Temperature and precipitation tables for the different localities in each district, accompanying this report, give the mean monthly temperature and the total monthly precipitation for the year, with the difference from the average in each case for the past ten years or more. These tables have been compiled from the monthly reports of the Meteorological Service of Canada, Mr. R. F. Stupart, F.R.S.C., director.

In compiling these tables an endeavor has been made to choose those observation stations that will most closely average the actual precipitations and temperatures over the whole division.

USES OF WATER.

The uses of water may more easily be discussed under the following headings: Municipal Water Supply, Irrigation, Reclamation, Water Power Developments, and Water Power Possibilities.

View of Stamp falls, on Stamp river.

In the accompanying lists the streams are classified under the different headings. Descriptions of each stream may be found either in this or a previous report. By referring to the lists, the number and year of the Water Resources paper describing each stream may be found.

MUNICIPAL SUPPLY.

The supply of pure water to municipalities, towns or cities requires the thorough investigation of the flow in available streams.

IRRIGATION.

The lands in the valley of the Fraser river, around Lillooet require irrigation. There are many small streams in this district which require to be controlled to give a regular supply of water during the dry season, which usually extends from June till September.

RECLAMATION.

The study of the high water on the Coquitlam river, in view of reclaiming the lands which are yearly flooded by the overflowing of the banks of this river, has been given considerable attention this year. Discharge data has been obtained for the year since January 25th. Other streams are listed in the report. The study of the stream flow of Lillooet river has been continued to ascertain the amount of water to be taken care of in the reclaiming of some forty square miles of good agricultural land at the head of Lillooet lake.

WATER POWER DEVELOPMENTS.

The water power developed on the streams investigated by this survey has been discussed in previous papers.

WATER POWER POSSIBILITIES.

Many inquiries are being received regarding the possibilities of the establishment of electro-chemical manufacturing plants on or near the coast. During the year very few new investigations were started on power streams in the Coast division, as funds have not been available for the extension of work. There are many economical developments available. All streams which have been examined by this survey for the economical development of hydro-electric energy have been discussed in previous reports.

The following list shows the present use and possible future uses of the water where gauging stations have been established, and indicates the reason for maintaining the station.

MUNICIPAL WATER SUPPLY.

Southern District.

Bridalveil creek	1915 report—Miscellaneous measurements.
Capilano creek	1913 report—(Water Resources Paper No. 8).
Dunville creek	1915 report—Miscellaneous measurements.
Elk creek	1915 report—Miscellaneous measurements.
Hutchison creek	1915 report—Miscellaneous measurements.
Lynn creek	1913 report—(Water Resources Paper No. 8).
Seymour creek	1913 report—(Water Resources Paper No. 8).
Silver-Pitt creek	1913 report—(Water Resources Paper No. 8).
Trout creek	1914 report—Miscellaneous measurements.
Windermere creek	1914 report—Miscellaneous measurements.

Vancouver Island District.

Browne creek	1915 report—Miscellaneous measurements.
Holt creek	1915 report—Miscellaneous measurements.
Millard creek	1915 report—Miscellaneous measurements.
Nanaimo—South Fork	1915 report—Miscellaneous measurements.
Shawnigan creek	1914 report—(Water Resources Paper No. 14).
Sooke river	1914 report—Miscellaneous measurements.

Lillooet District.

Lillooet creek	1915 report—Miscellaneous measurements.

IRRIGATION.

Southern District.

Silver-Hope creek	1913 report—(Water Resources Paper No. 8).

Lillooet District.

Cayuse creek	1914 report—(Water Resources Paper No. 14).
Foster Bar creek	1915 report.
Fountain creek	1914 report—(Water Resources Paper No. 14).
Laluwissin creek	1914 report—(Water Resources Paper No. 14).
Pavilion creek	1915 report.
Riley creek	1914 report—(Water Resources Paper No. 14).
Swartz creek	1915 report—Miscellaneous measurements.
Texas creek	1914 report—(Water Resources Paper No. 14).

Vancouver Island District.

No Irrigation.

RECLAMATION.

Southern District.

Chilliwack river	1913 report—(Water Resources Paper No. 8).
Coquitlam river	1915 report.
Silver-Pitt creek	1913 report —(Water Resources Paper No. 8).

Lillooet District.

Lillooet river	1913 report—(Water Resources Paper No. 8).

Vancouver Island District.

No reclamation.

WATER POWER DEVELOPMENTS.

Southern District.

Coquitlam river	1913 report—(Water Resources Paper No. 8).
Gilley creek	1913 report—(Water Resources Paper No. 8).
Jackman creek	1915 report—Miscellaneous measurements.
Power river	1913 report—(Water Resources Paper No. 8).
Stave river	1913 report—(Water Resources Paper No. 8).

Lillooet District.

McGillivray creek	1914 report—(Water Resources Paper No. 14) Seton creek

Vancouver Island District.

Puntledge river	1914 report—(Water Resources Paper No. 14).
Jordon river	1914 report—(Water Resources Paper No. 14).
Goldstream river	1914 report—(Water Resources Paper No. 14).

WATER POWER POSSIBILITIES.

Southern District.

Chehalis river	1913 report—(Water Resources Paper No. 8).
Chilliwack river	1913 report—(Water Resources Paper No. 8).
Coquihalla river	1913 report—(Water Resources Paper No. 8).
Jones creek	1913 report—(Water Resources Paper No. 8).
Mesliloet (Indian) river	1913 report—(Water Resources Paper No. 8).
Mesliloet river tributaries	1913 report—(Water Resources Paper No. 8).
Nicolum river	1914 report—(Water Resources Paper No. 14).
North Lillooet river	1913 report—(Water Resources Paper No. 8).
Rainbow creek	1913 report—(Water Resources Paper No. 8).
Raven creek	1913 report—(Water Resources Paper No. 8).
Sumallo river	1914 report—(Water Resources Paper No. 14).
Silver-Hope creek	1913 report—(Water Resources Paper No. 8).
Silver-Pitt creek	1913 report—(Water Resources Paper No. 8).
Slollicum creek	1913 report—(Water Resources Paper No. 8).
South Lillooet river	1913 report—(Water Resources Paper No. 8).

Lillooet District.

Brandywine river	1915 report.
Bridge river	1913 report—(Water Resources Paper No. 8).
Cheakamus river	1913 report—(Water Resources Paper No. 8).
Cayuse creek	1914 report—(Water Resources Paper No. 14).
Green river	1913 report—(Water Resources Paper No. 8).
Little Blackwater river	1914 report—(Water Resources Paper No. 14) Seton creek.
Soo river	1914 report—(Water Resources Paper No. 14).
Sixmile creek	1915 report—Miscellaneous measurements.

Vancouver Island District.

Campbell river	1914 report—(Water Resources Paper No. 14).
Stamp river at falls	1914 report—(Water Resources Paper No. 14).
Little Qualicum river	1914 report—(Water Resources Paper No. 14).
Nanaimo river	1914 report—(Water Resources Paper No. 14).
Sproat river	1914 report—(Water Resources Paper No. 14).
Stamp river at Great Central lake	1914 report—(Water Resources Paper No. 14).

Total Monthly Precipitation (Inches)—Southern District—1915.

Locality	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Britannia Beach	7.83	6.84	5.17	5.77	4.47	1.35	1.60	0.54	1.64	14.56	7.09	15.60	72.46
Vancouver	7.13	4.42	4.18	3.04	3.42	1.07	0.91	0.36	0.80	6.83	5.41	10.36	49.93
Steveston	4.34	2.62	2.78	1.75	2.52	0.33	0.53	0.33	0.37	6.14	3.92	7.44	33.07
Ladner	2.90	1.85	1.90	1.25	1.65	0.45	0.65	0.07	0.50	4.34	5.58	5.30	26.44
Buntzen lake	11.22	7.03	7.97	5.70	5.78	0.44	2.03	0.73	1.46	19.36	10.12	19.64	91.48
Coquitlam lake	15.87	10.95	12.24	8.62	7.38	0.63	2.29	0.86	1.56	24.59	15.02	24.91	124.92
New Westminster	6.98	4.04	4.22	3.47	3.12	0.61	0.92	0.16	1.46	10.29	6.09	10.90	52.26
Stave Falls	8.31	5.51	4.12	5.34	5.40	2.49	2.84	0.14	1.77	14.32	7.56	13.02	70.82
North Nicomen	8.70	4.21	3.13	4.98	4.64	1.60	1.92	0.03	1.46	11.61	7.46	13.62	63.36
Agassiz	7.17	5.67	2.45	5.37	5.20	2.36	1.62	0.07	1.26	11.26	7.75	15.39	65.57
Jones lake	4.97	3.86	3.53	5.36	6.53	4.11	2.56	0.36	2.54	15.15	9.35	12.88	71.20
Chilliwack	6.90	3.39	2.37	4.33	5.27	1.67	1.10	0.02	1.22	10.03	6.91	10.52	53.73
Hope	2.52	3.59	1.71	2.62	......	1.13	1.13	0.12	2.08	9.98	8.57	11.11	......

Difference from Average Precipitation (Inches)—Southern District—1915.

Difference of Total for Month from Monthly Average for Previous 10 Years or More.

Locality.	No. of Years Records	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Vancouver	14	-1.43	-1.80	-0.26	-0.05	-0.14	-1.75	-0.42	-1.35	-3.49	3.14	-5.87	2.80	-10.62
Steveston	19	-0.71	-1.41	0.25	-0.16	0.17	-1.53	-0.43	-0.81	-2.11	2.79	-3.12	2.13	-4.91
Ladner	14	-1.69	-2.27	-1.09	-0.56	-0.75	-1.20	-0.55	-1.08	-2.26	0.23	-0.58	0.40	-11.40
Buntzen lake	13	-4.45	-3.00	-1.02	-0.58	0.02	-4.13	-0.17	-2.28	-8.36	7.42	-10.02	6.73	-19.84
Coquitlam lake	12	-5.63	-3.76	1.22	0.26	-0.68	-5.08	-0.37	-3.27	-8.21	8.11	-14.80	6.39	-25.85
New Westminster	27	-0.87	-2.64	-1.17	0.25	-0.31	-2.15	-0.58	-1.64	-1.17	4.89	-3.04	2.89	-5.54
North Nicomen	23	0.13	-3.95	-2.95	-1.10	-0.01	-2.47	0.10	-2.08	-3.36	3.99	-5.20	3.95	-12.95
Agassiz	24	0.43	-0.11	-2.64	1.05	0.39	-2.46	-0.64	-2.68	-3.40	5.46	-1.16	8.62	2.26
Chilliwack	13	-0.24	-2.99	-1.93	0.63	1.09	-1.54	-0.57	-2.08	-2.88	4.10	-2.43	1.82	-7.02

N.B.—All quantities are plus unless otherwise designated.

Mean Monthly Temperature (Degrees Fahr.)—Southern District—1915.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
Britannia beach	......	......	......	50.3	55.5	58.8	64.0	65.0	57.0	50.0	40.0	37.0
Vancouver	38.2	42.5	47.7	52.3	56.2	60.5	65.0	66.0	58.0	51.0	42.0	39.0
Steveston	37.4	41.0	45.3	50.2	54.2	59.2	62.0	63.0	56.0	50.0	41.0	39.0
Ladner	39.2	43.9	48.9	52.9	56.3	62.3	63.0	61.0	56.0	49.0	42.0	41.0
New Westminster	37.0	41.3	48.2	52.1	55.9	60.5	65.0	66.0	58.0	51.0	41.0	38.0
Stave Falls	36.5	42.1	48.4	53.4	57.6	60.5	66.0	67.0	59.0	51.0	41.0	38.0
North Nicomen	37.5	41.7	49.0	53.1	53.4	60.8	66.0	67.0	59.0	51.0	41.0	38.0
Agassiz	37.4	41.0	48.1	50.2	54.3	59.4	63.0	66.0	57.0	48.0	40.0	38.0
Jones lake	27.3	33.1	38.3	47.1	51.5	55.7	62.0	64.0	52.8	44.1	32.4	29.2
Chilliwack	36.7	41.3	48.9	51.9	56.4	59.5	65.0	65.0	57.0	50.0	40.0	37.0
Hope	33.0	39.3	48.8	53.5	......	60.6	65.0	68.0	58.0	48.0	37.0	32.0

Difference from Average Temperature (Degrees Fahr.)—Southern District—1915.

Difference of Average for Month from Monthly Average for Previous 10 Years or More.

Locality.	No. of Years Records.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Vancouver	14	3.2	4.7	5.8	5.3	2.7	2.1	−1.0	4.0	2.0	2.0	0.0	0.0
Steveston	19	1.8	3.2	4.4	4.0	2.0	2.6	1.0	4.0	2.0	2.0	−1.0	0.0
Ladner	14	4.9	6.5	7.3	6.2	4.0	5.1	−1.0	2.0	1.0	0.0	−2.0	2.0
New Westminster	27	2.0	3.2	5.6	4.0	2.2	1.7	2.0	3.0	1.0	2.0	−1.0	0.0
North Nicomen	23	3.0	4.2	6.5	4.4	−1.3	1.8	1.0	4.0	2.0	1.0	−2.0	0.0
Agassiz	24	2.8	4.2	4.6	1.0	−1.2	0.4	−1.0	3.0	0.0	−3.0	−1.0	1.0
Chilliwack	13	0.4	3.1	5.9	1.9	1.1	−0.6	1.0	2.0	0.0	0.0	−1.0	0.0

N.B.—All quantities are plus unless otherwise designated.

Total Monthly Precipitation (Inches)—Lillooet District—1915.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Pemberton hatchery	2.50	3.28	1.47	2.12	1.91	0.65	1.63	0.53	0.36	6.59	2.02	5.98	29.04
Pembertonmeadows	3.99	3.69	1.73	2.58	0.93	0.51	1.25	0.36	0.51	5.88	4.65	7.93	34.01
Fifteenmile ranch (Pavilion)	0.58	0.38	0.15	......	1.64	1.01	1.48	1.93	0.15	0.42	......	......	......

Mean Monthly Temperature (Degrees Fahr.)—Lillooet District—1915.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Pemberton hatchery	28.0	35.7	42.7	50.0	55.1	61.1	66.0	67.0	56.0	47.0	34.0	29.0
Pemberton meadows	23.8	34.9	42.3	50.9	57.2	62.5	66.0	65.0	55.0	47.0	33.0	27.0
Fifteenmile ranch (Pavilion)	29.7	37.8	43.8	......	56.8	63.0	69.0	71.0	55.0	46.0	......	......

Total Monthly Precipitation (Inches)—Vancouver Island District—1915.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Victoria	1.55	0.98	1.53	0.57	1.26	0.61	0.84	0.04	0.80	4.20	4.57	4.78	21.73
Sooke	2.95	2.41	2.71	1.88	1.68	0.23	0.73	0.02	0.71	7.56	8.01	8.32	37.21
Shawnigan lake	2.23	2.07	1.94	1.57	1.79	0.88	0.73	0.08	0.71	3.77	8.27	10.57	34.61
Cobble hill	3.69	2.10	2.03	2.05	1.84	0.63	0.60	0.06	0.79	4.64	6.16	8.84	33.73
Cowichan (Tzouhalem)	4.64	2.85	2.17	2.13	2.44	0.40	0.50	0.16	0.76	5.21	6.32	9.67	37.25
Ladysmith	5.67	3.31	4.91	1.83	3.12	1.09	0.54	0.21	0.28	7.92	7.57	12.15	48.60
Nanaimo	3.85	3.27	2.98	2.18	2.84	0.44	0.81	0.15	0.38	5.61	5.87	8.47	36.85
Nanoose bay	2.91	3.89	1.66	1.32	2.37	0.78	0.55	0.25	0.47	4.85	5.49	4.06	23.60
Alberni	7.91	8.52	5.67	5.83	2.95	1.42	0.88	0.27	2.34	14.14	9.11	16.51	75.55
Alert bay	5.13	.....	2.75	3.19	......	0.46	1.38	0.18	1.27	11.43	5.89	......	......
Clayoquot	10.65	10.48	13.23	9.10	7.47	2.44	2.89	2.85	1.77	21.02	14.52	22.61	119.03
Quatsino	8.58	9.90	7.71	6.77	2.82	0.46	1.70	2.47	1.94	18.99	12.84	14.19	88.37
Holberg	10.98	14.73	9.71	14.12	5.73	1.67	3.49	3.55	5.16	24.99	18.34	23.18	135.65

Mean Monthly Temperature (Degrees Fahr.)—Vancouver Island District—1915.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Victoria	40.5	43.3	49.6	51.2	53.9	57.8	60.0	62.0	57.0	51.0	43.0	41.0
Sooke	39.3	42.1	48.3	50.4	53.9	58.2	61.0	63.0	55.0	52.0	42.0	40.0
Shawnigan lake	35.1	39.5	45.4	50.1	53.5	57.8	64.0	66.0	57.0	49.0	38.0	36.0
Cobble Hill	36.8	39.9	45.3	48.7	53.2	56.7	61.0	63.0	56.0	50.0	40.0	38.0
Cowichan (Tzouhalem)	37.1	42.1	47.0	51.6	55.0	60.2	64.0	66.0	58.0	51.0	41.0	39.0
Ladysmith	35.6	40.6	46.6	50.7	54.5	59.5	63.0	66.0	58.0	51.0	40.0	37.0
Nanaimo	37.7	41.9	46.5	51.0	55.3	61.0	65.0	66.0	58.0	51.0	41.0	40.0
Nanoose bay	36.4	36.6	44.9	49.6	53.9	59.5	64.0	66.0	57.0	49.0	40.0	38.0
Alberni	35.1	40.8	47.4	51.5	55.4	61.1	65.0	67.0	60.0	51.0	39.0	35.0
Alert Bay	40.4	......	48.2	49.6	......	56.8	59.0	62.0	56.0	50.0	41.0	......
Clayoquot	40.3	42.1	47.9	50.1	53.3	58.0	60.0	62.0	56.0	51.0	42.0	40.0
Quatsino	38.5	40.4	46.2	49.2	54.5	58.0	60.0	62.0	56.0	50.0	40.0	39.0
Holberg	39.0	41.0	47.1	48.8	54.1	58.4	61.0	64.0	58.0	51.0	43.0	42.0

Difference from Average Precipitation (Inches)—Vancouver Island District—1915. Difference of Total for Month from Monthly Average for Previous 10 Years or More.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Victoria	-2.99	-2.55	-1.02	-1.16	-0.04	-0.32	0.48	-0.61	-1.21	1.65	-1.89	-1.13	-10.79
Nanaimo	-2.33	-2.16	-0.42	0.48	0.82	-1.46	0.01	-0.61	-1.69	2.52	-2.90	1.30	-6.44
Alberni	-1.73	0.06	0.22	1.52	-0.11	-0.88	-0.09	-0.87	-0.75	8.40	-3.28	5.89	8.38
Clayoquot	-4.03	-2.50	3.26	0.73	0.74	-1.80	0.88	-0.69	-5.29	8.23	-5.06	6.22	0.69
Quatsino	-4.05	-1.19	-1.40	-0.92	-3.00	-4.17	-1.07	-1.58	-5.12	7.39	-4.41	-3.15	-22.67

Difference from Average Temperature (Inches)—Vancouver Island District—1915. Difference of Average for Month from Monthly Average for Previous 10 Years or More.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Victoria	1.3	3.0	6.5	3.5	0.9	0.7	0.0	2.0	1.0	1.0	-2.0	0.0
Nanaimo	1.8	3.1	4.2	3.5	1.3	2.6	1.0	3.0	1.0	1.0	-2.0	1.0
Alberni	1.4	3.1	5.3	3.6	0.7	2.2	0.0	2.0	2.0	0.0	-2.0	-2.0
Clayoquot	0.8	1.4	5.5	4.5	3.3	3.7	2.0	3.0	0.0	0.0	-3.0	-2.0
Quatsino	2.1	2.4	5.4	5.5	3.1	4.6	2.0	4.0	3.0	2.0	-2.0	-1.0

REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER III.

Kamloops Division.

REPORT OF C. G. CLINE, B.A.Sc., D.L.S.

DIVISION ENGINEER.

CHAPTER III.

KAMLOOPS DIVISION.

TERRITORY.

Geography.—The Kamloops division consists of the southern central portion of British Columbia, and comprises the provincial land districts of Kamloops, Similkameen, Osoyoos and a small part of Yale. It includes the watershed of the Thompson river, and a portion of the Columbia River basin lying north of the International boundary and drained by the Kettle, Similkameen and Okanagan rivers. The total area is 33,000 square miles.

The division coincides approximately with what is known to geologists as the Interior Plateau region which extends from the Coast range of mountains on the west to the Gold range on the east, and has the two branches of the Cascade range to the south and south-west. Many characteristic features of the climate of this part of the province are directly traceable to these circumstances of location and surroundings.

Topography and Geology.—The region is composed of extensive plateaus, numerous valleys, great and small, and broadly rounded summits with gently sloping sides. The general elevation of the plateaus is from 4,000 to 5,000 feet above sea-level. The deeper valleys, which contain the main drainage systems of the country are at about 1,000 feet. The rounded summits rise as high as 6,000 and 7,000 feet, there is a very considerable range of altitude.

Dawson falls, Murtle river.

The deeper valleys seem to have been scoured out by ice action or eroded by water. They are broadly U-shaped and are only partly occupied by the streams which flow through them. In certain cases, however, the streams have expanded into lakes, and fill practically the whole width of the valley bottom.

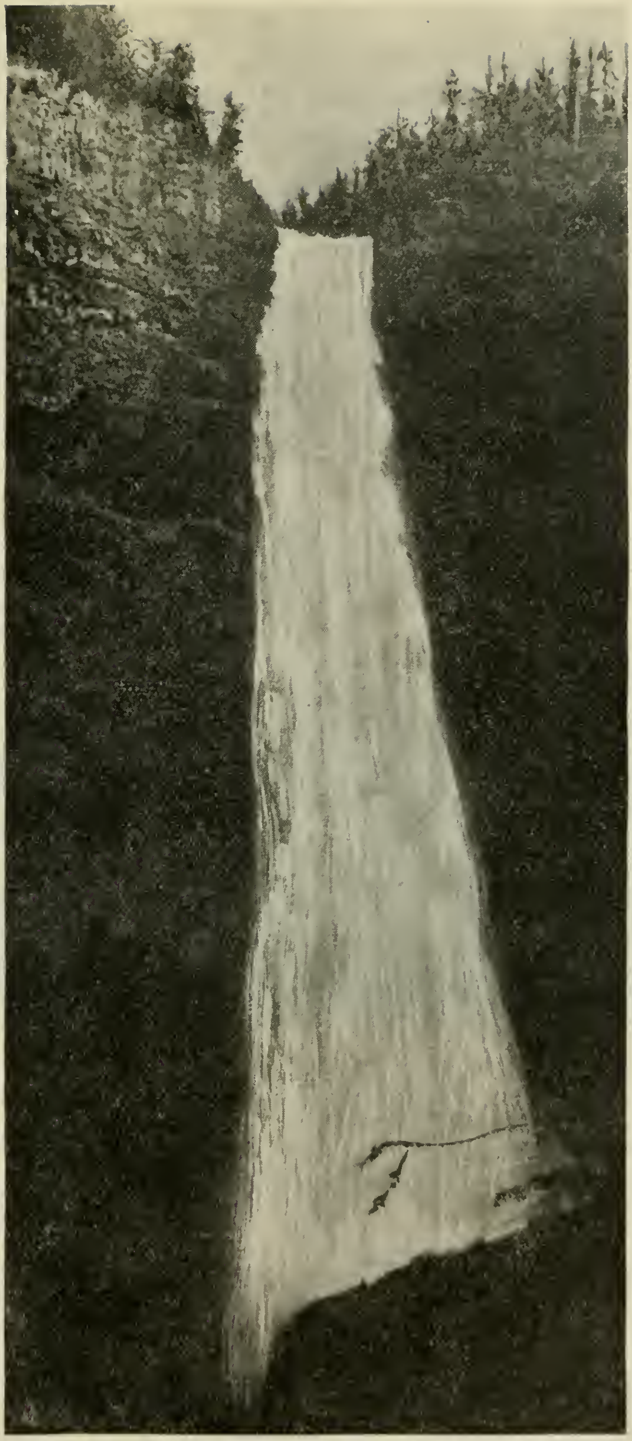
The depth of the tributary valleys and the steepness of their slope toward the main drainage system, seem to depend on the size of the streams. The valleys of the large rivers have been worn down until the slope is comparatively small, whereas the valleys of the small creeks are not nearly as deep and often descend hundreds of feet in a few miles. If a small stream which has its source on a plateau or on the side of a mountain, flows directly into one of the main drainage rivers, its descent is necessarily very rapid; if it is tributary to a stream of intermediate size, its descent is generally more gradual. As a rule, the smaller streams have the steeper slopes and are often more important for many purposes than the larger ones.

Alfalfa field beside South Thompson river, irrigated by pumping.

CLIMATE.

The Kamloops division is nearly all within the central dry belt. The winds from the Pacific ocean have been deprived of moisture on the western slope of the Coast range, and are heated as they descend to the plateau region. Winds from other directions are affected in a similar manner, so that they are generally capable of absorbing moisture. As a consequence, the climate is dry. The annual range of temperature is great, as is also the daily range in summer.

A study of the following tables will give an idea of some of the features of the climate in this part of the province. They give the precipitation and temperature for the stations of the meteorological service which are in this division. The variations from the average are also tabulated where the records extend over a period long enough to render the averages reliable.



Murtle river, at Helmcken falls. A sheer fall of 450 feet.
—Photograph by F. R. Archibald.

It is well to bear in mind that most of these stations are located in the main valleys in the centres of population, and that very few are on the plateaus and none on the mountains. The stations at Edith lake above Kamloops, and at the Nickel Plate mine above Hedley, show very clearly the difference in temperature and precipitation caused by a difference of two or three thousand feet in altitude. Both these stations have lower temperatures and greater precipitations than the ones in the valley below them though they are only a few miles away. For any considerable watershed area, the mean monthly precipitation and the mean monthly temperature may differ a good deal from the figures obtained at the centre of population of that area.

The influence of the mountain ranges is quite noticeable. Around Shuswap lake, which is just west of the Gold range, the precipitation is greatest, and it diminishes towards the south and west. There is a greater precipitation in the valley of the North Thompson river, than there is at Kamloops which has the valley of the South Thompson lying open to the east. The precipitation is fairly large in the Similkameen valley, but not nearly as large as it is on the western side of the Hope mountains. The effect of the mountains in increasing the precipitation is most noticeable on their western slopes, where the moisture-bearing winds from the west are cooled as they ascend to higher altitudes.

Thompson river. Irrigated lands, near Ashcroft.

The tables giving the variation from the average afford a ready means of comparing the weather conditions of 1915 with those of other years. They show that the winter was much milder than usual, with a rather lighter precipitation. As a result, very little snow remained on the hills till spring and it looked as though there might be a very considerable shortage of water. In the spring and summer, however, the precipitation was considerably heavier than usual so that the irrigationists and other water users had a fairly good supply.

USES OF WATER.

The general characteristics of the streams of this division previously mentioned, have a considerable effect on the uses to which they are put. A large stream flowing with a small slope through a broad, fertile valley, provides an unfailing supply of water, but for most purposes it is at so low an elevation that it is not easily utilized. A smaller tributary stream, on the other hand, while carrying less water, will generally have such a steep slope that the water can be diverted and carried through a gravity system to the places where it is needed. In many localities, therefore, practically the whole flow of a small stream may be used and found insufficient, whereas a large stream close at hand may be used very little or not at all. In such cases an accurate measurement of the discharge of the smaller stream is more important from an irrigation viewpoint than the measurement of the larger one.

One of the outstanding features of the use of water in this division is in the matter of irrigation. The large amount of sunshine and hot weather during the summer make ideal growing conditions, particularly in the larger valleys, but the small amount of precipitation, especially during the summer months, render irrigation necessary throughout nearly the whole division. On some of the higher lands, dry farming seems to be meeting with considerable success; but it is in the broad, fertile valleys that most of the farming is carried on, and it is there that irrigation is practiced so extensively. In the past, gravity supplies from the smaller streams have been given a marked preference, and no doubt these are the best where there is sufficient water. In certain localities, however, pumping plants are being installed to raise water from the large rivers and lakes on to land which could not be otherwise irrigated. Cheap hydro-electric power is quite an important factor in this development.

The following list shows the present use or possible future uses of the water, where gauging stations have been established, and indicates the reason for maintaining the station.

MUNICIPAL WATER SUPPLY.

Kamloops District.

Canoe creek	1911-12	report—(Water Resources Paper No. 1).

Okanagan District.

Brash creek	1915	report.
Chase creek	1911-12	report—(Water Resources Paper No. 1).
Crazy creek	1914	report—(Water Resources Paper No. 14).
Thompson river	1911-12	report—(Water Resources Paper No. 1).
Okanagan river	1914	report—(Water Resources Paper No. 14).

Ashcroft District.

Coldwater river	1914	report—Miscellaneous measurements.

IRRIGATION.

Kamloops District.

Bolean creek	1911-12	report—(Water Resources Paper No. 1).
Campbell creek	1911-12	report—(Water Resources Paper No. 1).
Cherry creek	1911-12	report—(Water Resources Paper No. 1).
Edwards creek	1911-12	report—(Water Resources Paper No. 1).
Guichon creek	1911-12	report—(Water Resources Paper No. 1).
Heffley creek	1911-12	report—(Water Resources Paper No. 1).
Ingram creek	1911-12	report—(Water Resources Paper No. 1).
Jamieson creek	1911-12	report—(Water Resources Paper No. 1).
Louis creek	1911-12	report—(Water Resources Paper No. 1).
Monte creek	1911-12	report—(Water Resources Paper No. 1).
Paul creek	1911-12	report—(Water Resources Paper No. 1).
Salmon river	1911-12	report—(Water Resources Paper No. 1).
Siwash creek	1914	report—(Water Resources Paper No. 14).
Threemile creek	1913	report—Miscellaneous measurements.
Tranquille river	1911-12	report—(Water Resources Paper No. 1).
Whitewood creek	1914	report—(Water Resources Paper No. 14).

Okanagan District.

Ashnola river	1914	report—(Water Resources Paper No. 14).
Chase creek	1915	report.
Manson creek	1915	report.
Niskonlith creek	1911-12	report—(Water Resources Paper No. 1).
Ross creek	1915	report.

Ashcroft District.

Barnes creek	1911-12	report—(Water Resources Paper No. 1)
Beaver creek	1915	report.
Bonaparte river	1911-12	report—(Water Resources Paper No. 1).
Cache creek	1911-12	report—(Water Resources Paper No. 1).
Coldwater river	1913	report—Miscellaneous measurements.
Criss creek	1911-12	report—(Water Resources Paper No. 1).
Deadman river	1911-12	report—(Water Resources Paper No. 1).
Hat creek	1911-12	report—(Water Resources Paper No. 1).
Nicola river	1911-12	report—(Water Resources Paper No. 1).
Spius creek	1911-12	report—(Water Resources Paper No. 1).

RECLAMATION.

Okanagan District.

Okanagan river	1914	report—(Water Resources Paper No. 14).

WATER POWER DEVELOPMENT.

Kamloops District.

Barriere river	1915	report.
Clearwater river	1914	report—(Water Resources Paper No. 14).
Little Clearwater river	1914	report—(Water Resources Paper No. 14).
Murtle river	1914	report—(Water Resources Paper No. 14).
Louis creek	1911-12	report—(Water Resources Paper No. 1).
North Thompson river	1911-12	report—(Water Resources Paper No. 1).
Raft river	1914	report—(Water Resources Paper No. 14).

Okanagan District.

Boundary creek	1914	report—(Water Resources Paper No. 14).
Crazy creek	1914	report—(Water Resources Paper No. 14).
Kettle river	1914	report—(Water Resources Paper No. 14).
Similkameen river	1914	report—(Water Resources Paper No. 14).
Twentymile creek	1913	report—(Water Resources Paper No. 8).

WATER POWER POSSIBILITIES.

Okanagan District.

Adams river	1911-12	report—(Water Resources Paper No. 1).
Eagle river	1911-12	report—(Water Resources Paper No. 1).
Granite creek	1914	report—(Water Resources Paper No. 14).
Okanagan river	1914	report—(Water Resources Paper No. 14).
Scotch creek	1913	report—Miscellaneous measurements.
Seymour creek	1913	report—Miscellaneous measurements.
Shuswap river	1911-12	report—(Water Resources Paper No. 1).
South Similkameen river	1914	report—(Water Resources Paper No. 14).
Tulameen river	1913	report—Miscellaneous measurements.

Ashcroft District.

Coldwater creek	1913	report—Miscellaneous measurements.
Nahatlatch river	1911-12	report—(Water Resources Paper No. 1).
Nicola river	1911-12	report—(Water Resources Paper No. 1).

LOGGING.

Okanagan District.

Adams river	1911-12	report—(Water Resources Paper No. 1).
Kettle river	1914	report—(Water Resources Paper No. 14).
Okanagan river	1914	report—(Water Resources Paper No. 14).

Ashcroft District.

Thompson river	1911-12	report—(Water Resources Paper No. 1).

Mean Monthly Temperature (Degrees Fahr.)—Kamloops Division—1915.

Locality.	Altitude.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Nicola														
Nicola lake	2120	16	28	39	.....	.....	.....	.....	66	53	47	32	27	......
Thompson														
Tranquille	1142	25	37	45	55	59	64	69	70	57	51	35	31	50
Kamloops	1245	23	37	45	56	58	63	69	72	57	50	33	30	49
Edith lake	3200	17	29	36	45	49	52	58	62	48	41	24	22	40
N. Thompson														
Chinook cove	......	22	34	41	51	56	58	64	67	53	46	31	26	49
Vavenby	1450	21	35	40	51	56	58	63	66	52	45	30	26	45
S. Thompson														
Monte creek	1156	21	33	39	51	55	60	67	69	56	50	.....	29	......
Tappen	1350	28	36	43	53	59	63	68	71	56	49	34	29	49
Salmon Arm	......	22	33	42	51	55	59	64	70	.....	48	33	28	......
Glenemma	......	26	37	48	.....	55	59	63	68	55	48	35	30	......
Okanagan valley														
Enderby	1180	23	33	42	52	57	60	66	69	55	44	33	27	47
Armstrong	1187	22	32	40	50	55	58	63	66	53	46	32	26	45
Vernon	1582	20	32	41	51	54	59	65	70	55	47	31	27	46
Richlands	......	19	31	38	47	50	57	.....	64	.....	44	28	26	......
Okanagan mission	1200	25	34	40	50	55	60	65	67	55	47	36	31	47
Summerland	1100	22	33	41	52	55	62	66	71	57	48	32	28	47
Penticton	......	27	36	43	53	56	62	66	70	57	51	35	31	49
Similkameen														
Princeton	1650	16	29	40	49	52	58	63	66	53	45	27	19	43
Hedley	1771	23	34	43	52	55	61	66	71	66	47	30	27	48
Hedley (Nickel Plate)	4500	20	26	31	40	.....	45	54	61	42	37	18	13	......
Kettle														
Greenwood	1746	16	31	39	48	52	55	62	67	53	45	27	24	43
Grand Forks	2400	18	32	......	53	55	61	66	71	56	46	30	25	......

Total Monthly Precipitation (Inches)—Kamloops Division—1915.

Locality.	Altitude.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Year.
Nicola														
Nicola lake	2120	0.95	0.00	0.30	....	..	..	...	0.57	0.83	0.82	0.77	1.36	......
Thompson														
Tranquille	1142	0.89	0.10	0.59	0.15	1.54	2.40	2.73	0.54	0.67	0.16	0.42	1.02	11.21
Kamloops	1245	0.93	0.00	0.47	0.17	2.28	2.49	1.15	1.32	0.61	0.80	0.38	1.60	12.20
Edith lake	3200	1.85	0.45	0.61	0.30	2.25	4.08	1.77	0.73	0.72	0.89	1.48	2.60	17.73
N. Thompson														
Chinook cove	.	0.75	0.57	0.76	0.40	2.80	3.32	2.76	0.87	1.13	1.05	0.55	1.56	16.52
Vavenby	1450	0.41	0.20	0.33	0.72	1.49	3.11	3.45	0.81	1.53	1.12	0.60	1.27	15.04
S. Thompson														
Monte creek	1156	1.75	Trace	1.32	0.28	1.64	3.54	0.79	0.98	0.41	0.38	0.17	0.88	12.14
Tappen	1350	2.51	0.76	1.01	1.34	3.55	3.92	2.75	0.60	1.22	1.34	1.96	3.23	24.19
Salmon arm	.	2.15	0.45	0.96	1.93	3.51	2.55	2.56	0.50	0.73	1.32	0.87	3.00	20.53
Glenemma	..	1.80	1.13	1.35	1.17	3.13	5.47	2.28	1.19	1.46	2.16	1.42	2.20	24.76
Canoe point	.	2.18	0.37	1.00	2.06	2.76	4.21	3.11	1.20	1.36	2.24	1.23	.....	.. ..
Okanagan valley														
Enderby	1180	2.29	0.54	1.39	2.15	2.88	4.84	2.28	0.20	1.23	1.19	0.96	2.10	22.05
Armstrong	1187	1.99	0.64	0.93	1.50	2.95	3.26	2.27	0.84	1.48	1.67	1.09	2.14	20.76
Vernon	1582	1.33	0.56	0.68	1.63	2.91	1.73	2.18	0.72	0.92	1.14	0.88	0.87	15.55
Richlands	....	1.60	0.73	0.47	2.08	4.98	3.11	...	0.83	2.20	1.57	0.46	0.80	.....
Okanagan mission	1200	1.24	0.36	0.82	0.79	2.55	0.88	1.89	0.26	1.65	1.21	1.31	1.23	14.19
Summerland	1100	0.53	1.00	1.28	0.48	2.83	0.86	2.41	0.27	1.24	1.16	0.82	1.85	14.73
Penticton	....	0.65	0.44	1.08	0.91	3.49	1.16	2.35	0.27	1.01	0.99	0.77	1.14	14.26
Similkameen														
Princeton	1650	0.75	0.25	0.76	0.41	2.54	0.96	2.56	1.36	1.07	1.00	2.02	1.67	15.35
Hedley	1771	0.25	0.54	0.53	0.65	3.35	1.18	2.29	0.71	1.32	1.13	0.38	1.23	13.56
Hedley (Nickel Plate)	4500	0.80	0.60	0.80	2.06	...	1.30	2.25	0.25	2.02	1.73	3.15	3.80	......
Kettle														
Greenwood	1746	0.72	1.10	0.92	2.40	4.24	1.59	3.25	0.61	0.71	0.80	1.20	3.63	21.17
Grand Forks	2400	1.25	0.99	. .	1.99	3.61	1.82	3.44	0.05	0.89	1.21	0.97	1.25	.

Difference from Average Precipitation (Inches)—Kamloops Division—1915.

Difference of Total for Month from Monthly Average for Previous 10 Years or More.

Locality.	No. of Years Records.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Nicola lake	20	0.10	-0.84	-0.31	.....	....	....	.....	-0.40	-0.30	0.14	-0.59	0.46	.. .
Kamloops	23	-0.02	-0.80	0.15	-0.19	1.35	1.26	-0.12	0.27	-0.33	0.21	-0.67	0.50	1.16
Enderby	13	-0.30	-1.08	0.28	1.38	1.57	2.71	0.80	-1.03	-0.47	-0.32	-1.78	-0.20	1.56
Vernon	21	0.17	-0.56	-0.04	0.11	1.68	-0.07	0.82	-0.31	-0.56	0.35	-0.61	-0.40	0.57
Okanagan mission	16	-0.09	-0.74	-0.02	0.33	1.52	-0.34	0.12	-0.77	0.48	0.36	-0.68	-0.15	0.02
Princeton	19	-0.61	-0.68	0.16	-0.12	1.20	-0.13	1.31	0.46	0.02	0.17	0.15	0.33	2.26
Hedley	11	-0.78	-0.67	0.09	0.20	1.79	-0.21	1.08	-0.27	0.64	0.43	-0.59	0.53	2.24
Hedley (Nickel Plate)	11	. .	....	-0.60	-1.64	.....	-1.44	0.77	-1.39	0.99	-0.05	-0.85	1.70	.. . .

N.B.—All quantities are plus unless otherwise designated.

Difference from Average Temperature (Degrees Fahr.)—Kamloops Division—1915.

Difference of Average for Month from Monthly Average for Previous 10 Years or More.

Locality.	No. of Years Records.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Nicola lake	20	-3	4	7	.....	.....	.....	.....	5	0	3	-1	0	. ..
Kamloops	23	1	10	8	6	1	-1	-1	4	-1	2	-3	1	27
Enderby	13	1	9	7	5	2	-1	-0	5	1	0	1	-1	29
Vernon	21	0	6	6	4	0	-1	-1	5	0	2	-3	-1	17
Okanagan mission	16	1	9	3	3	-1	-1	-2	3	0	2	0	1	18
Princeton	19	1	6	8	5	0	1	0	4	0	2	-4	-3	20
Hedley	11	3	7	7	5	1	1	-1	6	1	1	-6	-2	23
Hedley (Nickel Plate)	11	3	4	5	5	.....	2	-2	8	-5	0	-11	-9	......

REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER IV.

Nelson Division.

REPORT OF C. E. RICHARDSON, B.A.Sc., D.L.S.

DIVISION ENGINEER.

CHAPTER IV.

NELSON DIVISION.

TERRITORY.

Geography.—This division covers approximately 29,000 square miles of the south and eastern part of the province of British Columbia. The division might readily be called "Kootenay division" as it extends over practically all of that area known as Kootenay district. It is bounded on the north by the height of land connecting the summit of the Rockies with the summit of the Columbia or Gold mountains; on the west by the summit of the Columbia range; on the south by the 49th parallel of latitude or International boundary, and on the east by the backbone of the Rockies. This area is very mountainous, with numerous lakes, rivers and creeks, which afford innumerable opportunites for future water power development; there are three rivers, however, that constitute the drainage system of the whole division; these are the Columbia, the Kootenay and the Pend d'Oreille.

The Columbia rises in the Columbia and Windermere lakes, 90 miles south-east of Golden and flows in a north-westerly direction for about 200 miles to the mouth of Canoe river at Big Bend, near the northerly limits of the division.

From Canoe river the Columbia flows practically south for about 250 miles, past Revelstoke, through the beautiful Arrow lakes, crossing the International boundary near Waneta, B.C. Kootenay river rises in the Beaverfoot range of the Rockies, about 35 miles south-east of Golden and flows practically south for 175 miles, passing within one mile of Columbia lake and crossing the International boundary near Newgate, B.C. It flows through Montana into Idaho, entering West Kootenay 60 miles west of Newgate and 20 miles south of Kootenay Landing, at which point the river loses itself in beautiful Kootenay lake. From the west arm of Kootenay lake the river flows in a south-westerly direction, discharging into Columbia river 20 miles north of the boundary. Pend d'Oreille river, of which Flathead river in East Kootenay is a tributary, has only a small portion of its drainage in Canada. It discharges into Columbia river about 200 yards above the International boundary.

Hot springs are numerous, several being located in the vicinity of Windermere lakes, Halcyon, Ainsworth and other points.

In the division three national parks are located—The Yoho, Glacier and Revelstoke. Each park has its outstanding features. Yoho with its Yoho valley, Takakkaw falls, natural bridge and Emerald lake; Glacier with Illecillewaet, Grand and Gegic glaciers and mammoth snowfields; Revelstoke, with its prairie country near the summit of Mt. Revelstoke.

The chief industries are mining (of coal, gold, lead, silver, copper and zinc) lumber (chiefly B.C. fir and western pine) and farming (mixed and fruit).

Transportation facilities are afforded by the main line of the C.P.R. in the north, and various branch lines of the C.P.R. and Great Northern in the south. Navigation is carried on continuously on Kootenay and Arrow lakes. Good roads are frequent in East Kootenay and government trails give access to other principal points of interest.

TOPOGRAPHY.

Mountain Systems.—The topography of Nelson division is relative to four mountain systems—the Rockies, the Purcells, the Selkirks and the Columbia range.

The summit of the Rockies, which constitutes the eastern boundary of the division, consists of a well defined range studded with snow-capped peaks, many of which are well over 10,000 feet. The western slope includes various local ranges, mostly paralleling the main range. The more famous passes are Crowsnest, Vermilion and Kicking Horse, about 5,000 feet at the divides. The larger rivers from south to north are the Elk, Bull, Kootenay, above Canal flats, Kicking Horse, Blaeberry and Bush. These streams, with the possible exception of the Bull, are all glacial fed and the valleys generally are well timbered to an elevation of 7,000 feet.

The Purcells constitute that system to the west of the Rockies bounded on the north by the confluence of Columbia and Beaver rivers, on the east by Columbia and Kootenay rivers, on the south by the Kootenay and on the west by the north-flowing portion of Kootenay river, Kootenay lake, Duncan river and Beaver rivers.

The principal streams fed by the Purcells are, Goat, Moyie, Yahk, St. Marys, Findlay, Dutch, Toby, Horsethief, Forsters (No. 2), Bugaboo, Spillimacheen, Hammil and Fry. Many of these streams are glacial fed.

The Selkirks extend southward from the Big Bend of Columbia river, lying between the Rockies and Purcells on the west and Columbia range on the east. The northern portion of the Selkirks are strikingly scenic, peaks are high and treacherous; passes are few, Rogers pass alone is well known. The more important rivers are Incomappleux, Akolkolex, Illecillewaet, Downie, Gold, and Mountain. Well known glaciers are the Illecillewaet or Great glacier, Grand glacier and Gegic glacier. One mammoth snowfield feeds these glaciers.

The summit of Columbia or Gold range forms the western boundary of this division. This system of mountains is less impressive than the three already described. The larger rivers are Inonoaklin, Whatshan, Arrowpark, Pingston, and Jordon. A few small glaciers may be found in the higher peaks.

Trenches.—Between the ranges of mountains above mentioned there are these great depressions or trenches, namely, Rocky Mountain trench, Purcell trench and "Selkirk valley."

Rocky Mountain trench lies between the Rockies and the Purcells in the south and Selkirk in the north of this division. It extends in Canada from the International boundary in a north-westerly direction as far north as Alaska and perhaps to the Arctic ocean. In Nelson division it is occupied by south-flowing Kootenay river, the north-flowing Columbia and Canoe rivers. The average width of its floor is 5 miles but in the neighborhood of St. Marys river, near Cranbrook, it is 16 miles wide and varies in width to the International boundary, affording in the plains possibilities for agriculture.

Purcell trench, approximately 200 miles in length, separates Purcell range on the east from the Selkirks on the west. It is occupied by Beaver river, Duncan river, Kootenay lake and north-flowing Kootenay river. On an average the valley is 2 to 5 miles wide.

Selkirk valley or trench is occupied by Columbia river, flowing south, and the Arrow lakes. It is from 3 to 5 miles in width and separates the Selkirks on the east from Columbia or Gold range on the west. Upper Arrow lake is about 40 miles long and from 2 to 3 miles wide. The mountains rise abruptly to an altitude of from 5,000 to 7,000 feet. The lower lake is about 50 miles long and has an average width of 2 miles. There are pronounced falls on practically all the tributaries to the lakes.

Showing thickness of ice on Bull river.

Geology.—Mining is by far the most important industry in this division. In 1913 and 1914 approximately two-thirds of the mine production of British Columbia was from the Kootenay-Boundary district. Gold, silver, lead, copper, zinc and coal are mined in various localities, particularly in the southern part.

CLIMATE.

Run-off is relative directly to topography and climate. Climatic conditions are themselves partially dependent on topography. In the study of stream flow it is essential to be familiar with these two factors. The topography, however, remains a constant factor and the variation in the flow of streams is due therefore directly to climatic conditions. In this division the peculiar topography affords a remarkable climate. It is impossible to assume that the climatic conditions at a certain point will be general in that neighborhood. On the other hand although there are marked variations in some sections a general resemblance may be seen between other localities.

The following tables are appended:—

1. Monthly and yearly precipitation, 1915.
2. Differences from average precipitation.
3. Mean monthly and average temperatures, 1915.
4. Differences from average temperature.

These tables are compiled from the monthly reports for 1915 of the Meteorological Service, Mr. R. F. Stupart, director.

In these tables a comparison is shown between 10 points, 5 in East Kootenay and 5 in West Kootenay. With the exception of Glacier and Fernie these points are all in the valleys of Columbia and Kootenay rivers—practically the lowest points in their respective localities. It must be remembered that the precipitation or temperature at any one of these points does not represent the precipitation or temperature in its locality.

USES OF WATER.

MUNICIPAL SUPPLY.

In the Kootenays the mountain streams, lakes and springs generally afford an ample supply for municipal purposes without much difficulty being encountered. It is essential, however, in many cases, that a study of the streams be made. The variation of the flow is so great that unless those interested are familiar with the streams, they will be deceived by appearances. Studies are now being carried on by this survey with regard to municipal supply and when possible any assistance will gladly be given interested parties.

IRRIGATION.

The scarcity of agricultural land and the richness of the soil necessitates the utilization of all available land in an attempt to fulfil the demands of the local markets. With the exception of small plots here and there, the valleys of Columbia and Kootenay rivers afford the only location of agricultural lands. The largest farming district is in the Rocky mountain trench (see description under topography) from Spillimacheen south to the International boundary.

Irrigation is practised to some extent in the valleys throughout the whole division. It is essential in East Kootenay, south of Spillimacheen. In the vicinity of Edgewater and Athalmer two companies, holding large tracts of land, installed irrigation systems, which include over 30 miles of flume.

At present systematic records during the irrigation season are being obtained on approximately 15 irrigation streams.

MINING.

In the operation of practically all mines the use of water is essential. After the ore is mined and shipped to the smelter, water and water power become an important factor.

Various requests have come in during the year for information on small streams for mining purposes. Where possible information is supplied, but these streams are so numerous that it is hard to tell upon which information will be required.

RECLAMATION.

There are two large reclamation projects in this division—on the Columbia between Golden and Spillimacheen, and on the Kootenay above Kootenay lake. The former is at present under way, surveys have been made and plans submitted. This scheme deals with the reclamation of about 15,000 acres. The Kootenay flats reclamation is an international affair, including probably more land in the United States than in British Columbia. The required surveys, etc., have not as yet been made.

Systematic and reliable stream flow data is being obtained in connection with these projects on the Columbia, near Golden and Kootenay river, at the outlet of the lake, near Nelson.

WATER POWER DEVELOPMENT.

A rather complete list of water power developments was published in the report of the division engineer, Kootenay Boundary division, in Water Resources Paper No. 8. These powers were listed under "Mining" and under "Hydro-electric Developments." Since that list was published no large plants have been installed. Various small powers of from 100 to 500 H.P. have since been utilized for mining purposes and improvements and additions have been made to some of the larger plants. The West Kootenay Light and Power Co. have remodelled their plant at lower Bonnington Falls to accommodate the demand for power of the new zinc smelter at Trail. The City of Revelstoke have remodelled their municipal plant and installed a new turbine and generator, which greatly increases the efficiency of the plant.

Power is used extensively for mining. Of the total installation, probably in excess of 40,000 horse power, over 30,000 horse power is used for mining and smelting. Installations in this division are comparatively cheap, due to the pronounced falls and canyons on most of the streams.

WATER POWER POSSIBILITIES.

Water Power possibilities throughout the Kootenay are innumerable and dozens of unnoticed sites would be in demand were they located in other parts of the Dominion. The topographic conditions afford in most cases a high head at considerably less than the average cost for Canada. The combination of the climatic and topographic conditions on the other hand is often a detriment. The variation in flow is extreme, a heavy freshet generally occurring in May, June or July, and very low water with frazil ice occurring in February and March, A careful study of the characteristics of each individual stream is essential before any plant is installed. The streams throughout this division are most deceptive and it is not safe to estimate the run off of any one stream from a study of its next door neighbor.

The following list shows the present use and possible future uses of the water where gauging stations have been established, and indicates the reason for maintaining the station.

MUNICIPAL WATER SUPPLY.

Revelstoke District.

Field Springs (No. 1)	1914	report—(Water Resources Paper No. 14).
Field Springs (No. 2)	1914	report—(Water Resources Paper No. 14).
Field Springs (No. 3)	1914	report—(Water Resources Paper No. 14).
Hospital creek (Weir)	1914	report—(Water Resources Paper No. 14).

IRRIGATION.

Revelstoke District.

Findlay creek	1914	report—(Water Resources Paper No. 14).
North Vermillion	1914	report—(Water Resources Paper No. 14).
South Vermillion	1914	report—(Water Resources Paper No. 14).
Washout	1911-12	report—(Water Resources Paper No. 1). (Miscellaneous measurements.)

Cranbrook District.

Cherry creek	1914	report—(Water Resources Paper No. 14).
Gold creek	1914	report—(Water Resources Paper No. 14).
Linklater creek	1914	report—(Water Resources Paper No. 14).
Phillips creek	1914	report—(Water Resources Paper No. 14).
Rock creek	1914	report—(Water Resources Paper No. 14).
Big Sand creek	1914	report—(Water Resources Paper No. 14).
Little Sand creek	1911	report—(Water Resources Paper No. 14).

RECLAMATION.

Nelson District.

Duncan river	1914	report—(Water Resources Paper No. 14).
Fry creek	1914	report—(Water Resources Paper No. 14).
Glacier creek	1914	report—(Water Resources Paper No. 14).
Kootenay river	1913	report—(Water Resources Paper No. 8).

Revelstoke District.

Bugaboo river	1913	report—(Water Resources Paper No. 8).
Columbia river	1911-12	report—(Water Resources Paper No. 1).
No. 2 creek	1911-12	report—(Water Resources Paper No. 1).
Spillimacheen creek	1911-12	report—(Water Resources Paper No. 1).
Toby creek	1911-12	report—(Water Resources Paper No. 1).

WATER POWER POSSIBILITIES.

Nelson District.

Carpenter creek	1914	report—(Water Resources Paper No. 14).
Columbia river	1913	report—(Water Resources Paper No. 8).
Columbia river	1913	report—(Water Resources Paper No. 8).
Goat creek	1914	report—(Water Resources Paper No. 14).
Inonoaklin creek	1915	report.
Kaslo creek	1914	report—(Water Resources Paper No. 14).
Kooskanax creek	1914	report—(Water Resources Paper No. 14).
Kootenay river	1913	report—(Water Resources Paper No. 8).
Kootenay river	1913	report—(Water Resources Paper No. 8).
Pend d'Oreille river	1913	report—(Water Resources Paper No. 8).
Silverton (below mill)	1914	report—(Water Resources Paper No. 14).
Silverton (above mill)	1914	report—(Water Resources Paper No. 14).
Slocan river	1913	report—(Water Resources Paper No. 8).

Revelstoke District.

Akolkolex river	1911-12	report—(Water Resources Paper No. 1).
Blaeberry river	1913	report—(Water Resources Paper No. 8).
Columbia river (Revelstoke)	1911-12	report—(Water Resources Paper No. 1).
Illecillewaet river	1911-12	report—(Water Resources Paper No. 1).
Incomappleux river	1911-12	report—(Water Resources Paper No. 1).
Kicking Horse (Golden)	1911-12	report—(Water Resources Paper No. 1).
Kicking Horse (Field)	1911-12	report—(Water Resources Paper No. 1).
Kicking Horse (No. 2)	1911-12	report—(Water Resources Paper No. 1).

Cranbrook District.

Bull river	1914	report—(Water Resources Paper No. 14).
Elk river	1914	report—(Water Resources Paper No. 14).
Kootenay river	1914	report—(Water Resources Paper No. 14).
Mark creek	1914	report—(Water Resources Paper No. 14).
Moyie river	1914	report—(Water Resources Paper No. 14).
St. Marys river	1914	report—(Water Resources Paper No. 14).

Mean Monthly Temperatures (Degrees Fahr.)—Nelson Division—1915.

Locality.	No. of Years Records.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Golden	14	13.5	.....	.....	.....	54.4	56.6	60.0	64.0	49.0	42.0	.....	.....	.....
Wilmer	7	15.0	27.2	36.5	48.4	52.1	55.3	.....	66.0	50.0	43.0	25.0	20.0	.....
Glacier	13	16.5	24.5	30.8	39.7	47.1	50.1	56.0	61.0	44.0	37.0	24.0	20.0	37.67
Revelstoke	16	19.6	32.0	39.0	48.5	55.2	57.9	63.0	66.0	52.0	44.0	32.0	27.0	44.7
Nakusp	4	23.5	31.5	38.7	48.0	53.5	56.9	61.0	68.0	50.0	44.0	32.0	27.0	44.5
Nelson	12	25.1	30.4	41.1	50.3	53.8	63.6	65.0	70.0	54.0	45.0	32.0	27.0	46.4
Waneta	3	21.8	.....	40.1	.....	52.1	55.7	64.0	70.0	54.0	45.0	29.0	24.0	.....
Cranbrook	15	18.9	29.0	37.7	48.5	53.0	56.9	60.0	67.0	50.0	45.0	26.0	21.0	42.8
Elko	20	21.4	31.9	38.8	51.9	55.4	58.5	62.0	71.0	53.0	48.0	32.0	25.0	45.7
Fernie	2	17.7	26.4	33.9	46.6	50.4	53.5	59.0	65.0	49.0	44.0	27.0	22.0	41.2

Total Monthly Precipitation (Inches)—Nelson Division—1915.

Locality.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.	Year.
Golden	0.80	......	......	......	1.62	3.64	4.75	0.62	1.05	2.31	......	......	.....
Wilmer	0.85	0.48	0.08	0.45	1.63	4.02	......	0.51	0.91	0.80	1.01	0.80	.....
Glacier	5.60	4.30	0.63	2.76	2.90	5.42	6.29	1.82	2.41	8.09	9.60	7.95	57.77
Revelstoke	3.40	2.18	0.84	3.19	4.83	2.93	4.91	0.72	2.51	5.87	3.68	5.12	40.18
Nakusp	2.00	1.62	1.02	3.85	4.57	3.70	3.11	0.63	1.05	2.84	2.01	3.53	29.93
Nelson	1.10	0.80	0.85	2.59	3.72	2.09	3.87	0.60	1.12	2.18	3.16	3.57	25.65
Waneta	1.20	......	2.07	......	4.85	3.03	4.26	0.10	0.80	2.38	3.25	3.55	.....
Cranbrook	0.60	0.70	0.12	0.12	2.26	2.13	2.88	0.31	1.84	0.94	2.84	1.50	16.24
Elko	1.85	1.14	0.86	0.72	2.91	3.99	2.27	0.60	4.38	1.93	2.11	2.10	24.85
Fernie	1.84	2.86	0.75	1.05	2.83	4.47	1.84	0.26	2.19	3.45	6.84	5.91	34.29

Difference from Average Precipitation (Inches)—Nelson Division—1915.

Difference of Total for Month from Monthly Average for Previous 10 Years or More.

Locality.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Golden	-1.73	......	......	......	0.70	2.00	3.43	-1.01	-0.60	0.84	......	......	.....
Glacier	-2.04	-1.99	-4.82	0.13	1.30	2.43	3.95	-0.70	-1.73	4.17	0.50	-0.12	1.00
Revelstoke	-1.81	-2.36	-1.99	1.23	2.61	-0.04	2.41	-1.94	-0.88	1.99	-1.85	0.56	-2.07
Elko	0.25	-0.14	-0.26	-0.16	0.58	1.49	0.43	-0.74	2.04	0.94	0.14	0.85	5.42
Nelson	-2.25	-1.51	-0.79	1.30	1.55	-0.70	1.87	-1.34	-0.67	-0.12	-0.35	1.03	-1.98
Cranbrook	......	-0.78	......	......	0.79	0.42	1.48	......	......	0.24	1.15	-0.07	.....

Difference from Average Temperature (Degrees Fahr.)—Nelson Division—1915.

Difference of Average for Month from Monthly Average for Previous 10 Years or More.

Locality.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Golden	3.2	......	......	......	3.7	-0.4	-1.0	6.0	-1.0	2.0	......	......	......
Glacier	1.7	6.5	5.4	4.2	2.3	-1.1	0.0	5.0	-2.0	0.0	-2.0	1.0	21.0
Revelstoke	-0.3	9.3	6.2	6.5	3.4	-0.8	-1.0	5.0	-1.0	1.0	-2.0	0.0	26.3
Nelson	0.3	1.9	4.4	3.8	0.1	3.0	-1.0	7.0	-2.0	0.0	-5.0	-4.0	8.5
Elko	-0.7	6.2	4.4	6.8	2.0	-1.5	-3.0	8.0	3.0	5.0	-4.0	-4.0	22.2
Cranbrook	......	10.0	......	......	2.3	0.0	0.0	......	......	3.0	-3.0	1.0	......

REPORT
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CHAPTER V.

Fort George District.

REPORT OF J. A. ELLIOTT, B.A.Sc.
DISTRICT ENGINEER.

CHAPTER V.

FORT GEORGE DISTRICT.

TERRITORY.

Geography.—The completion of the Grand Trunk Pacific Railway opens up a large portion of central British Columbia for settlement and development. This railway enters British Columbia through the Yellowhead pass at about latitude 53°, and traversing the province in a north-westerly direction it crosses the 55th parallel near Hazelton, there turning south-west it reaches the Pacific coast at Prince Rupert, near latitude 54°.

The Fort George district covers the territory adjacent to the Grand Trunk Pacific Railway, between the Rocky mountains and the coast. The district is divided by the Great Interior plateau into two main drainage basins—the Fraser and the Skeena.

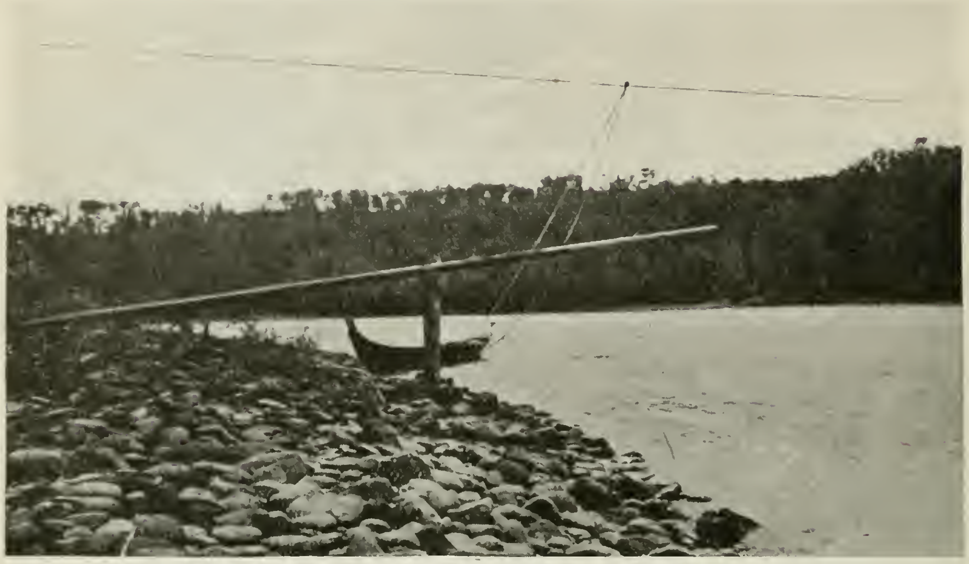
The Fraser river rises near the summit of the Yellowhead pass at an altitude of 3,710 feet. Flowing due west it falls 1,300 feet in 52 miles; near Tete Jaune it turns north-west and flows through the "Inter-montane" valley to about latitude 54°; at Fort George it receives the waters of the Nechako river and then turns westward and southward. Near Fort George it is at an altitude of 1,900 feet—a descent of 500 feet in about 200 miles.

The Nechako, the largest northern affluent of the Fraser, is 255 miles long. It rises on the eastern slope of the Interior plateau and drains several large lakes, including Ootsabunkut, 40 miles long, Cheslatta, 25, Francais, 60, and Fraser, 12 miles. About 50 miles from its confluence with the Fraser, the Nechako receives the waters of its northern tributary, Stuart river, which is 220 miles long and drains two large lakes,—Stuart lake with an area of 221 square miles and Tacla, 135 square miles.

The Skeena basin drains all the land west of the Great plateau. The Skeena river rises on the eastern slope of the Coast range at about latitude 57° and flows almost directly south for about 175 miles; near Hazelton it turns south-west and flows through the Coast range for 154 miles to the Pacific ocean, being the first river north of the Fraser to cut across this range of mountains. About 35 miles north of Hazelton the Babine river flows into the Skeena. The Babine rises in Babine lake, which has an area of 306 square miles. It drains the north-eastern slope of the Babine range. At Hazelton the Skeena receives the waters of the Bulkley river. This river rises near the summit of the Great plateau and flows in a north-westerly direction to its confluence with the Skeena.

Topography.—The upper Fraser river flowing west from Yellowhead Pass lies in an "Inter-montane" valley between the Selwyn range and the Rainbow mountains, a part of the great Rocky Mountain system. The Rainbow mountains are composed of a group of high snow-capped peaks, notable among which are,—Mount Mowat (9,293 feet), Mount Kain (9,392 feet), Mount Resplendent (11,178 feet), Lynx Mountain (10,471), Mount Helmet (11,160 feet) and Mount Robson (13,700 feet), the highest peak and greatest mass in the Canadian Rockies.

The most prominent peaks in the Selwyn group are Mount Geikie (11,016 feet) and Mount Fitzwilliam (9,747 feet).



Chain gauge and measuring section, on Skeena, at Hazelton. Measurements are made from the Indian dugout canoe shown in the foreground, points of observation being marked by a tag line.

Fifteen-foot falls, on Fraser river, near Albreda.

It is from the snowfields and glaciers of the Rainbow mountains that the upper Fraser river receives its great volume of water. Moose river, a tributary, flowing from the eastern slopes of Resplendent, Kain and Lynx mountains has a fall of about 150 feet in Rainbow canyon, near its mouth. To the west and north of Mount Robson lies the valley of the Grand Fork of the Fraser river, part of which is known as the "Valley of a Thousand Falls," where the famous Emperor falls are located.

West of the Rainbow mountains the "Inter-montane" valley becomes a little wider and the flanking mountains less massive and predominant; on the north it is still bounded by the Rocky mountains, but the south by the lower and less massive Cariboo range, which is separated from the Selwyn range by McLellan river, flowing north to the Fraser, and Canoe river, flowing south to the Columbia. The streams rising in the Caribou range are not of great length or fall.

Near Fort George, the Fraser, turning southward, flows between the Cariboo range on the east and the Telegraph range on the west. The Telegraph range is not very prominent, being the height of land of the Great Interior plateau, dividing the watersheds of Nechako and Chilcotin rivers.

The Nechako river, flowing into the Fraser at Fort George, drains a great basin, which is said by geologists to be an old lake bed. This basin now contains many large lakes. On the south-west it is bounded by the lower Telegraph and Fawnie ranges and the heights of the Interior plateau; to the west lies the Coast range, and on the north and east the upper Nechako valley is confined by the Omineca mountains and the ridge between the Parsnip and Stuart valleys. Throughout the Nechako district there are no very great differences in elevation.

The Bulkley valley is more undulating and varies from four to ten miles in width. On the north-east it is bounded by the Babine mountains and on the south-west by the Hudson bay and massive Rochers DeBoules mountains. The streams rising in the Rochers DeBoules mountains are short in length but contain many falls and rapids.

The upper Skeena valley lies between the Coast and Cassiar ranges. The Cassiar range at the south being terminated by the Babine river valley. Westward from Hazelton the Skeena valley cuts the Coast range transversely. The bounding mountains are high and clearly outlined, the valley is narrow and deep. Many of the streams of this district have considerable fall and pass through canyons in the deep valleys.

The relative elevations of points in the Skeena and Fraser drainage basins may be well shown by the following altitudes at points along the Grand Trunk Pacific Railway:—

		Feet
Skeena	Terrace	240
	Hazelton	985
Bulkley	Moricetown	1353
	Hubert	1690
	Houston	1952
Height of land near Rose lake		2366
Nechako	Fraser lake	2,208
	Vanderhoof	2,097
	Stuart river	2,087
	Fort George	1,870
Fraser	Willow river	1,921
	McBride	2,370
	Tete Jaune	2,400
	Lucerne	3,619

Geology.—There is little known at present of the geological formation of the district, very little mapping having been done. The mineral deposits in many parts of the district are known to be very rich. On the east, in the Rocky mountains and Cariboo range, copper and gold are found in several places, though no extensive mining has yet been carried on. Placer gold may be found in nearly all the streams of the Cariboo range. Mica is found in large quantities near Tete Jaune cache, and marble near McBride.

Several large discoveries of metalliferous veins have been found in the Bulkley and Skeena valleys and are especially predominant in the Hudson bay, Rochers DeBoules and Babine mountains. Silver-lead and chalcopyrite are the principal valuable minerals present. Zinc-blende, pyrite, arseno-pyrite and stibnite are also associated in this formation. Very little development has yet been done on any of the properties. However, owing to the impetus given to the metal market by the present war, development work is now being prosecuted on many properties in preparation for shipping. The Rochers DeBoules Copper Company have opened up a large mine near Hazelton and are now shipping large quantities of ore to the smelters. The Silver-Standard, near Hazelton, and the Cordillera Copper Mine, near Usk, have done considerable development and have recently entered the shipping lists.

Thin streaks of bituminous coal are found in considerable areas in the Bulkley and Telkwa river valleys.

CLIMATE.

The warm Japan current, flowing south along the coast of British Columbia, has a moderating influence on the climate of the central interior of the province. Warm winds penetrate the deep inlets and following the low passes at their heads spread over the Great Central plateau.

Very little meteorological data is obtainable, as yet, in this district. The only point at which rainfall and snowfall observations have been observed for any length of time is at Fort St. James, on Stuart river. The Dominion Meteorlogical Bureau recently established observation stations at New Hazelton, Fort St. James, and Central Fort George. Tables showing precipitation and temperature at these stations are appended hereto.

USES OF WATER.

The settlement along the greater part of the Grand Trunk Pacific being very recent, there has as yet been little commercial or industrial development of the water resources. The chief industries in this district are farming, mining and lumbering. Many small towns have been established along the railway at the central points of the various districts.

MUNICIPAL SUPPLY.

At present most of these towns are of such recent growth that no plants for distribution of water have been constructed, however this is a question of vital importance to every community and in several cases investigations are being made to determine the best source of municipal supply.

IRRIGATION.

Farming will no doubt be the chief industry of this part of the province. In many parts of the district, land is rapidly being taken up by settlers. Agricultural development of every kind is being prosecuted. Irrigation is practically unnecessary throughout the district, but where desired, an adequate supply may always be obtained from any of the numerous small streams.

WATER POWER DEVELOPMENTS AND POSSIBILITIES.

The power possibilities of this district are as yet unknown. At the present time there are only two hydro-electric plants in the district.

Woodworth Lake.

The city of Prince Rupert has installed a 1650 horse-power hydro-electric plant at Woodworth lake to generate light and power for the municipality. Water is diverted from the lake through a 45-inch pipe line 7,800 feet long, and operates under a head of 330 feet. The pipe line is also used as a means of auxiliary supply to the municipal water system.

Juniper Creek.

The Rochers DeBoules Copper Company have installed a small hydro-electric plant on Juniper creek, near Hazelton, in connection with the development of their mines. Water is carried from Juniper creek through a wood stave pipe 3,783 feet long and is delivered to a Pelton-Doble wheel under an effective head of 178 feet.

A splendid example of the latent power of the district is given by the Bulkley river, which flows in a deep, narrow canyon for 30 miles from its mouth and falls 1,000 feet in this distance.

Total Monthly Precipitation (Inches)—Fort George District—1915.

Locality.	No. of Years Records.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Fort George......	3	0.15	0.10	0.85	1.23	2.22	1.67	1.88	1.46	1.26	.....	......	.....	......
Fort St. James......	22	0.36	0.84	0.73	0.73	1.36	1.54	3.54	0.60	0.89	2.25	0.96	0.86	14.60
New Hazelton......	2	0.63	1.34	0.48	1.04	1.30	2.25	3.47	2.27	1.67	2.25	0.47	1.19	18.36

Difference from Average Precipitation (Inches)—Fort George District—1915.
Difference of Total for Month from Monthly Average for Previous 10 Years or More.

Locality.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Fort St. James....	-1.22	-0.35	-0.09	-0.16	0.47	0.04	2.32	-0.79	-0.34	1.05	-0.96	-0.69	-0.72

At Fort St. James the average precipitation per year (1903-12) was 15.24 inches.
N.B.—All quantities are plus unless otherwise designated.

Mean Monthly Temperature (Degrees Fahr.)—Fort George District—1915.

Locality.	No. of Years Records.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Fort George........	3	12.4	24.2	35.8	43.1	50.8	56.7	61.0	62.0	47.0	.....	......	.....	......
Fort St. James......	22	11.9	20.1	35.2	40.6	51.8	57.7	62.0	62.0	50.0	40.0	23.0	20.0	39.5
New Hazelton......	2	20.1	26.3	40.3	44.3	54.5	57.7	63.0	59.0	51.0	45.0	31.0	27.0	43.3

Difference from Average Temperature (Degrees Fahr.)—Fort George District—1915.

Difference of Average for Month from Monthly Average for Previous 10 Years or More.

Locality.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Fort St. James.....	4.7	7.6	13.7	6.3	8.2	6.9	7.0	9.0	5.0	3.0	-1.0	3.0	73.4

N.B.—All quantities are plus unless otherwise designated.

REPORT

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BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER VI.

Coast Division.

HYDROMETRIC DATA.

CHAPTER VI.

COAST DIVISION—HYDROMETRIC DATA.

SOUTHERN DISTRICT.

BELKNAP CREEK AT BELKNAP LAKE.—(1000).

Location.—At the outlet of Belknap lake, in section 36, township 6, range 7, west of 7th meridian.

Records Available.—Daily discharges from October, 1912, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Not determined.

Gauge.—Vertical staff gauge read bi-weekly by Mr. J. L. Davis.

Channel.—Bed of stream strewn with boulders, giving uneven bottom but permanent control.

Discharge Measurements.—Eleven meter measurements made during 1912-13-14-15, define rating curve very well except for extreme high water.

Winter Flow.—Very heavy snowfall but little ice. Open water conditions practically all winter.

Accuracy.—"D." (Poor, because gauge readings were infrequent).

Co-operation.—Gauge readings are made by employees of Westminster Power Company.

Discharge Measurements of Belknap River at Belknap Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 11	C. E. Dobbie	1057	40	125	1.2	2.68	149
July 22	R. V. Gordon	1505	39	70	0.7	1.63	50

Daily Gauge Height and Discharge of Belknap Creek at Belknap Lake for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	31	....	15	1.3	22	....	104	....	98	....	77
2	....	32	....	16	....	19	....	117	....	106	....	75
3	....	32	1.2	17	1.2	17	....	130	2.4	115	2.0	74
4	....	33	....	17	....	17	....	143	....	126	....	83
5	1.50	33	1.2	17	....	17	....	157	....	136	....	92
6	....	34	....	23	....	17	2.8	170	....	147	....	100
7	....	36	....	30	....	17	....	178	....	158	....	110
8	1.55	37	....	40	....	17	....	186	....	169	2.45	120
9	....	34	1.7	49	1.2	17	....	194	....	180	....	90
10	....	31	....	40	....	21	....	202	2.9	190	2.0	74
11	....	28	....	30	1.35	25	....	210	2.7	155	....	74
12	1.35	25	1.25	20	....	115	....	220	....	143	....	74
13	....	21	....	19	....	210	3.1	230	....	131	....	74
14	1.20	17	....	17	....	300	....	250	....	119	2.0	74
15	....	17	....	15	3.8	390	3.3	280	....	107	....	72
16	....	16	1.1	13	....	250	....	248	....	95	1.95	70
17	....	15	....	23	2.3	103	....	217	2.1	83	....	73
18	....	14	1.5	33	....	105	....	186	....	95	....	76
19	....	13	....	31	....	106	2.7	155	....	110	....	79
20	1.10	13	....	30	....	107	....	140	2.5	125	....	82
21	....	12	....	29	....	109	....	120	....	132	....	85
22	1.05	12	....	27	....	111	2.3	103	....	140	2.15	88
23	....	11	1.35	25	....	113	....	98	....	148	....	83
24	....	10	....	38	2.4	115	....	93	2.7	155	....	78
25	0.9	10	1.7	49	....	90	....	88	....	150	2.0	74
26	....	10	....	41	1.9	65	2.1	83	....	145	....	67
27	0.9	10	....	34	....	65	....	83	2.6	140	....	60
28	....	11	....	27	....	65	....	83	....	125	1.75	53
29	....	12	....	....	1.9	65	2.1	83	....	110	....	46
30	....	13	....	....	....	78	....	90	....	95	....	40
31	....	14	....	....	....	91	....	....	2.05	78	....	....

	July.		August.		September.		October.		November.		December.	
1	....	90	....	30	....	30	1.3	22	....	460	....	90
2	2.15	88	....	28	1.65	45	....	24	4.0	430	....	130
3	....	74	1.39	26	....	46	....	26	....	460	2.8	170
4	....	71	....	24	....	47	....	28	....	485	....	160
5	....	68	....	21	....	48	....	30	4.4	510	....	150
6	1.90	65	1.22	18	1.70	49	1.5	33	....	420	2.6	140
7	....	77	....	18	....	40	....	26	....	320	....	270
8	....	89	....	17	....	33	....	20	....	220	....	400
9	2.30	103	....	16	....	26	1.1	13	....	120	4.5	530
10	....	93	....	15	1.24	19	....	15	1.25	20	....	410
11	....	83	1.15	15	....	17	....	17	....	18	....	290
12	....	74	....	15	....	15	1.25	20	....	16	....	170
13	1.90	65	....	15	....	13	....	42	....	16	1.8	57
14	....	63	1.16	15	1.00	11	....	65	....	16	....	54
15	1.85	61	....	15	....	11	2.15	88	....	14	....	52
16	....	56	....	15	....	11	....	125	1.1	13	1.7	49
17	....	51	1.15	15	1.00	11	....	160	....	23	....	115
18	....	47	....	15	....	11	....	195	1.5	33	....	180
19	....	43	....	16	....	10	3.1	230	....	70	3.20	250
20	1.58	39	....	17	0.90	10	....	310	....	100	....	206
21	1.63	43	1.20	17	....	10	....	390	....	130	....	162
22	1.63	43	....	17	....	10	4.2	470	....	160	....	118
23	....	43	....	17	0.90	10	....	445	2.9	190	2.0	74
24	....	42	1.20	17	....	10	....	425	....	220	....	62
25	....	42	....	16	....	10	3.85	400	3.2	250	....	52
26	....	41	....	16	....	9	....	505	....	210	....	40
27	1.59	40	1.15	15	....	9	4.90	610	....	170	....	28
28	....	38	....	15	0.85	9	....	580	....	130	1.2	17
29	....	36	....	15	....	12	....	550	....	90	....	15
30	....	34	....	15	....	15	....	520	1.8	57	1.1	13
31	....	32	1.15	15	....	....	....	490	....	....	....	11

Monthly Discharge of Belknap Creek at Belknap Lake for 1915.

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	37	10	21	....	....	....
February	49	13	27	....	....	....
March	390	17	92	....	....	....
April	280	83	155	....	....	....
May	190	78	129	....	....	....
June	120	40	77	....	....	....
July	103	32	59	....	....	....
August	30	15	17	....	....	....
September	49	9	20	....	....	....
October	610	13	222	....	....	....
November	510	13	179	....	....	....
December	250	11	144	....	....	....
The year	610	9	95	....	....	....

BELKNAP CREEK BELOW ANN LAKE.—(1063).

Location.—About half way between Ann lake and Belknap lake, near the proposed site for the diversion dam, and in section 36, township 7, range 7, west of 7th meridian.

Records Available.—Daily discharges from June, 1913, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Not determined.

Gauge.—Vertical staff gauge read bi-weekly by Mr. J. L. Davis.

Channel.—Boulders and gravel.

Discharge Measurements.—Eight discharge measurements made during 1913-14-15 define the rating curve accurately except for extreme high stages.

Winter Flow.—Ice conditions at gauging station in very cold weather.

Accuracy.—"D." Poor because of infrequent gauge readings.

Co-operation.—Gauge readings are made by the employees of the Westminster Power Company.

Discharge Measurements of Belknap River below Ann Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 11	C. E. Dobbie	1057	31	87.4	1.50	2.40	128.0
Aug. 21	R. V. Gordon	1505	31	66.0	0.66	1.43	44.0
Nov. 11	H. C. Hughes	1046	31	51.0	0.32	0.84	16.4

Daily Gauge Height and Discharge of Belknap Creek below Ann Lake for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	23	....	9	0.85	14	....	76	....	70	....	63
2	....	23	....	10	0.80	12	....	88	....	70	....	63
3	....	24	0.75	10	....	12	....	100	1.90	70	1.80	63
4	....	25	....	10	....	11	....	110	....	75	....	72
5	1.10	26	0.75	10	....	11	....	120	....	80	....	81
6	....	26	....	16	....	10	2.45	130	....	85	....	90
7	....	28	....	22	....	9	....	136	....	90	2.20	99
8	1.15	28	....	28	....	8	....	142	....	95	....	80
9	....	26	1.25	33	0.70	8	....	148	....	105	....	70
10	....	24	....	25	....	12	....	156	....	115	1.75	60
11	....	22	....	18	0.90	17	....	165	2.40	122	....	60
12	0.95	20	0.80	12	....	80	2.70	173	....	110	....	60
13	....	16	....	11	....	140	....	185	....	100	....	60
14	0.80	12	....	10	....	230	....	195	....	100	1.75	60
15	....	11	....	9	3.40	310	2.90	210	....	100	....	58
16	....	10	0.70	8	....	190	....	185	....	90	1.70	57
17	....	10	....	15	1.90	70	....	160	2.00	77	....	59
18	....	9	1.00	22	....	74	....	135	....	87	....	61
19	....	8	....	20	....	78	2.30	110	....	97	....	63
20	0.70	8	....	18	....	78	....	97	2.30	110	....	65
21	....	7	....	18	....	82	....	80	....	120	....	67
22	....	7	....	16	....	82	1.80	63	....	132	1.90	70
23	0.65	6	0.85	14	....	85	....	61	....	143	....	68
24	....	7	....	19	2.10	87	....	59	2.60	155	....	62
25	0.70	8	1.05	24	....	67	....	59	....	145	1.75	60
26	....	6	....	22	1.60	51	1.70	57	....	135	....	54
27	0.60	5	....	18	....	50	....	59	2.40	122	....	50
28	....	5	....	16	....	48	....	61	....	105	1.50	46
29	....	6	....	....	1.50	46	1.80	63	....	90	....	46
30	....	7	....	....	....	56	....	66	....	75	....	46
31	....	8	....	....	....	66	....	....	1.80	63	....	....

	July.		August.		September.		October.		November.		December.	
1	....	105	....	39	....	30	1.00	22	....	440	....	90
2	2.2	99	....	39	1.45	44	....	24	3.75	400	....	125
3	....	92	1.36	39	....	44	....	24	....	435	2.65	164
4	....	86	....	32	....	44	....	26	....	470	....	152
5	....	80	....	25	....	44	....	26	4.15	500	....	140
6	1.95	74	0.94	19	1.45	44	1.15	28	....	420	2.45	130
7	....	89	....	18	....	39	....	24	....	340	....	260
8	....	104	....	18	....	33	....	16	....	260	....	390
9	2.35	116	....	17	....	27	0.75	10	....	180	4.25	525
10	....	104	....	15	0.98	21	....	22	....	100	....	410
11	....	94	0.85	14	....	19	....	34	0.85	14	....	290
12	....	84	....	14	....	16	1.50	46	....	16	....	170
13	1.95	74	....	15	....	13	....	56	....	16	1.55	48
14	....	64	0.86	15	0.75	10	....	64	....	18	....	48
15	1.65	54	....	15	....	9	1.95	74	....	18	....	46
16	....	52	....	14	....	7	....	106	0.95	20	1.5	46
17	....	49	0.85	14	0.64	6	....	138	....	26	....	205
18	....	46	....	14	....	6	....	170	1.25	33	....	365
19	....	43	....	13	....	6	2.85	201	....	45	4.25	525
20	1.38	40	....	13	0.65	6	....	284	....	57	....	465
21	1.43	42	0.83	13	....	6	....	367	....	69	....	400
22	1.43	42	....	15	....	6	3.95	450	....	81	....	340
23	....	42	....	18	0.65	6	....	422	2.15	93	3.25	280
24	....	42	0.95	20	....	6	....	394	....	156	....	220
25	....	41	....	20	....	5	3.60	365	2.95	220	....	170
26	....	41	....	20	....	5	....	495	....	180	....	120
27	1.40	41	0.96	20	....	4	4.65	625	....	150	....	70
28	....	41	....	18	0.60	4	....	590	....	120	0.90	17
29	....	40	....	18	....	9	....	555	....	90	....	16
30	....	40	....	16	....	14	....	520	1.65	54	0.85	15
31	....	39	0.85	14	....	....	....	480	....	....	....	14

Monthly discharge of Belknap River below Ann Lake for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	28	5	15			
February	33	8	17			
March	310	8	68			
April	210	57	115			
May	155	63	101			
June	99	46	64			
July	116	39	65			
August	39	13	19			
September	44	4	18			
October	625	10	215			
November	500	14	167			
December	525	14	202			
The year	625	4	89			

BOULDER CREEK.—(1001).

Location.—Near mouth of creek, and near Jones lake, in section 28, township 3, range 27, west of 6th meridian.

Records Available.—Daily discharges from January, 1913, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Not determined.

Gauge.—A fine wire is stretched tightly across the stream and the distance to the water surface is measured by a graduated rod. The result subtracted from 15.00 gives the direct reading. Daily gauge readings by Mr. R. Barr.

Channel.—The channel is about 30 feet wide. The bed of the stream is covered with boulders, giving uneven bottom but good control.

Discharge Measurements.—Six discharge measurements made during 1911-12-13-14, define the curve very well except for extreme high stages of the water.

Winter Flow.—The stream is affected by ice for about a month each winter.

Accuracy.—Below 100 cubic feet per second, "B." Above 100 cubic feet per second, "C."

Co-operation.—The records on this stream are kept by Messrs. Anderson & Warden, Civil Engineers, Vancouver, for the Vancouver Power Company.

Discharge Measurements of Boulder Creek near Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec.-ft
April 23	Cline & Hughes	1521	30	39.2	1.00	10.3	40.4

Daily Gauge Height and Discharge of Boulder Creek near Mouth for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	15	....	13	4.20	13	4.90	85	4.50	28	4.90	85
2	4.25	15	....	13	4.20	13	5.45	190	4.50	28	4.85	75
3	4.25	15	....	13	4.20	13	5.50	200	4.85	75	4.80	65
4	4.25	15	....	13	4.20	13	5.20	140	4.70	50	4.80	65
5	4.25	15	....	13	4.20	13	5.00	105	4.80	65	4.90	85
6	4.20	13	....	13	4.20	13	4.80	65	4.90	85	4.90	85
7	4.20	13	....	14	4.20	13	4.90	85	4.90	85	4.80	65
8	4.20	13	Frozen	15	4.20	13	4.80	65	4.90	85	4.70	50
9	4.20	13	4.30	16	4.20	13	4.70	50	4.80	65	4.65	44
10	4.20	13	4.30	16	4.25	15	4.65	42	4.85	75	4.65	44
11	4.40	22	4.25	15	4.25	15	4.70	50	4.70	50	4.80	65
12	4.35	19	4.20	13	4.20	13	4.95	95	4.70	50	4.75	57
13	4.25	15	4.25	15	4.25	15	4.90	85	4.70	50	4.80	65
14	4.25	15	4.20	13	4.55	32	4.80	65	4.85	75	4.70	50
15	4.20	13	4.15	11	5.05	112	4.80	65	4.70	50	4.75	57
16	4.20	13	4.15	11	4.55	32	4.90	85	4.70	50	4.70	50
17	4.20	13	4.20	13	4.60	37	5.10	120	4.70	50	5.00	105
18	4.20	13	4.20	13	4.75	58	5.00	105	5.10	120	4.80	65
19	4.20	13	4.20	13	4.60	37	5.00	105	5.30	160	4.80	65
20	4.20	13	4.20	13	4.60	37	4.95	95	5.20	140	4.75	57
21	4.20	13	4.20	13	5.00	105	4.80	65	4.90	85	4.70	50
22	Frozen	13	4.20	13	5.10	120	4.70	50	4.95	95	4.70	50
23	....	13	4.15	11	5.10	120	4.65	44	4.85	75	4.70	50
24	....	13	4.15	11	5.90	85	4.65	44	4.90	85	4.65	44
25	....	13	4.20	13	4.70	50	4.70	50	4.90	85	4.60	37
26	....	13	4.20	13	4.60	37	4.70	50	4.80	65	4.60	37
27	....	13	4.20	13	4.50	28	4.70	50	4.80	65	4.60	37
28	....	13	4.20	13	4.50	28	4.70	50	5.25	150	4.60	37
29	....	13	....	....	4.70	50	4.70	50	4.95	95	4.60	37
30	....	13	....	....	4.70	50	4.60	37	4.80	65	4.60	37
31	....	13	....	....	4.70	50	....	....	4.80	65	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	4.60	37	4.20	13	4.10	10	4.10	10	5.00	105	4.30	16
2	4.55	32	4.20	13	4.10	10	4.55	32	4.85	75	4.30	16
3	4.55	32	4.20	13	4.05	9	4.30	16	4.75	57	4.35	19
4	4.50	28	4.20	13	4.05	9	4.25	14	4.75	57	4.60	37
5	4.45	25	4.15	12	4.05	9	4.35	19	4.85	75	4.60	37
6	4.65	44	4.15	12	4.05	9	4.25	14	4.65	43	4.50	28
7	4.50	28	4.15	12	4.05	9	4.15	12	4.60	37	4.40	22
8	4.50	28	4.15	12	4.10	10	4.15	12	4.50	28	5.40	180
9	4.45	25	4.15	12	4.25	14	4.10	10	4.45	25	4.80	65
10	4.45	25	4.15	12	4.20	13	4.10	10	4.40	22	4.70	50
11	4.45	25	4.15	12	4.10	10	4.10	10	4.35	19	4.45	25
12	4.45	25	4.15	12	4.10	10	4.45	25	4.35	19	4.45	25
13	4.45	25	4.15	12	4.10	10	4.40	22	4.30	16	4.40	22
14	4.65	44	4.15	12	4.10	10	4.65	43	4.30	16	4.35	19
15	4.85	75	4.10	10	4.10	10	4.40	22	4.30	16	4.30	16
16	4.80	65	4.10	10	4.10	10	4.30	16	4.45	25	4.25	14
17	4.75	58	4.15	12	4.10	10	4.25	14	4.40	22	4.25	14
18	4.65	44	4.15	12	4.10	10	4.30	16	4.45	25	4.20	13
19	4.50	28	4.10	10	4.10	10	4.65	43	4.50	28	4.20	13
20	4.50	28	4.10	10	4.05	9	5.30	160	4.40	22	4.20	13
21	4.45	25	4.10	10	4.05	9	4.85	75	4.40	22	4.95	95
22	4.40	22	4.10	10	4.05	9	4.75	57	4.35	19	4.85	75
23	4.40	22	4.10	10	4.05	9	4.75	57	4.45	25	4.70	50
24	4.35	19	4.10	10	4.10	10	4.70	50	4.40	22	4.65	43
25	4.30	16	4.10	10	4.10	10	5.30	160	4.40	22	4.65	43
26	4.25	14	4.10	10	4.05	9	5.40	180	4.40	22	4.65	43
27	4.30	16	4.05	9	4.05	9	5.35	170	4.30	16	4.65	43
28	4.25	14	4.05	9	4.05	9	5.65	230	4.30	16	4.60	37
29	4.25	14	4.05	9	4.05	9	5.00	105	4.30	16	Ice	37
30	4.25	14	4.05	9	4.05	9	4.85	75	4.30	16	....	37
31	4.25	14	4.10	10	......	....	5.70	240	....	....	....	37

Monthly Discharge of Boulder Creek near Mouth for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	22	13	14	....	....	....
February	16	11	13	....	....	....
March	120	13	40	....	....	....
April	200	37	80	....	....	....
May	160	28	76	....	....	....
June	105	37	57	....	....	....
July	75	14	29	....	....	....
August	13	9	11	....	....	....
September	14	9	10	....	....	....
October	240	10	62	....	....	....
November	105	16	31	....	....	....
December	180	13	38	....	....	....
The year	240	9	38	....	....	....

BRANDT CREEK ABOVE YOUNG CREEK.—(1021).

Location.—A few hundred feet above the mouth of Young creek, in section 10, township 7, range 7, west of 7th meridian.

Records Available.—Daily discharges from November, 1914, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Not determined.

Gauge.—Cable gauge. Gauge read bi-weekly by Mr. J. L. Davis.

Channel.—Solid rock at control. The channel is about 15 feet wide.

Discharge Measurements.—Five meter measurements made during 1914 and 1915 define the curve fairly well except for extreme stages of the water.

Winter Flow.—Very heavy snowfall but practically no ice, so that open water conditions prevail practically all winter.

Accuracy.—"D," because of infrequent gauge readings.

Co-operation.—Gauge readings are maintained by the Westminster Power Company.

Discharge Measurements of Brandt Creek above Young for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 8	C, E. Dobbie	1057	9.5	14.9	0.70	1.85	10.5
July 19	R. V. Gordon	1505	8.0	5.9	0.47	1.47	2.8
July 23	R. V. Gordon	1505	7.5	5.2	0.33	1.38	1.7
Nov. 10	H. C. Hughes	1046	7.0	7.0	0.60	1.60	4.2

Daily Gauge Height and Discharge of Brandt Creek above Young for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	6.5	....	9.0	1.7	6.5	....	13.0	....	27.0	....	13.0
2	....	6.5	1.75	7.7	....	5.5	....	13.0	....	33.0	....	13.0
3	....	6.5	....	5.0	1.6	4.5	....	13.0	2.3	39.0	1.9	13.0
4	1.70	6.5	1.55	3.7	....	4.5	....	13.0	....	35.0	....	10.8
5	....	7.0	....	5.0	....	4.5	....	13.0	....	29.0	....	8.7
6	....	7.5	....	6.0	....	4.5	1.9	13.0	....	23.0	....	6.6
7	1.75	7.7	....	8.0	....	4.5	....	16.0	....	17.0	1.6	4.5
8	....	8.0	1.8	9.0	1.6	4.5	....	19.0	1.85	11.0	....	4.5
9	....	8.3	....	8.0	....	5.5	....	22.0	....	11.0	....	4.5
10	....	8.6	....	7.0	1.7	6.5	....	25.0	....	11.0	1.6	4.5
11	1.80	9.0	1.7	6.5	....	25.2	....	25.0	....	12.0	....	4.0
12	....	9.0	....	6.0	....	43.9	....	28.0	....	12.0	....	4.0
13	....	9.0	....	5.0	....	62.6	2.2	30.0	....	12.0	....	3.5
14	1.80	9.0	....	4.0	....	81.3	....	40.0	....	12.0	1.5	3.0
15	....	8.1	1.5	3.0	2.7	100.0	2.4	50.0	....	13.0	....	3.0
16	....	7.2	....	10.0	....	58.0	....	41.0	....	13.0	1.5	3.0
17	....	6.3	2.0	17.0	2.0	17.0	....	33.0	1.9	13.0	....	3.0
18	....	5.4	....	13.5	....	18.0	....	25.0	....	15.0	....	3.0
19	1.60	4.5	....	10.5	....	19.0	2.0	17.0	....	15.0	....	3.0
20	....	5.0	....	8.5	....	21.0	....	15.0	2.0	17.0	....	3.0
21	1.65	5.5	....	6.5	....	23.0	....	12.0	....	19.0	....	3.0
22	....	4.6	1.6	4.5	....	25.0	1.8	9.0	....	20.0	1.5	3.0
23	....	3.7	....	6.0	2.15	26.0	....	10.0	....	21.0	....	3.0
24	1.50	3.0	1.75	7.7	....	18.0	....	11.0	2.1	23.0	....	2.0
25	....	9.0	....	7.3	1.8	9.0	....	12.0	....	28.0	1.4	2.0
26	....	16.0	....	7.1	....	9.0	1.9	13.0	....	33.0	....	2.0
27	2.10	23.0	....	6.9	....	9.0	....	12.0	2.3	39.0	....	2.0
28	....	20.0	....	6.7	1.8	9.0	....	10.0	....	31.0	1.4	2.0
29	....	17.0	....	....	....	11.0	1.8	9.0	....	25.0	....	2.0
30	....	14.0	....	....	1.9	13.0	....	15.0	....	19.0	....	2.0
31	....	11.0	....	....	....	13.0	....	....	1.9	13.0	....	....

	July.		August.		September.		October.		November.		December.	
1	....	1.5	....	0.5	....	3.9	1.6	4.5	....	40.0	....	40.0
2	1.30	1.5	....	0.4	1.70	6.5	....	4.5	2.1	23.0	....	70.0
3	....	1.5	0.76	0.4	....	5.0	....	5.5	....	30.0	2.7	100.0
4	....	1.5	....	0.4	....	4.0	....	5.5	....	40.0	....	88.0
5	1.30	1.5	0.75	0.3	....	3.0	....	6.5	2.4	50.0	....	75.0
6	....	2.0	....	0.5	1.28	1.4	4.7	6.5	....	40.0	2.5	62.0
7	....	2.0	....	0.8	....	1.0	....	4.0	....	30.0	....	150.0
8	....	3.0	....	0.8	....	1.0	....	4.0	....	20.0	....	230.0
9	1.60	4.5	....	1.0	....	1.5	1.3	1.5	....	15.0	3.8	320.0
10	....	4.0	1.25	1.3	1.40	2.0	....	6.0	1.60	4.5	....	240.0
11	....	4.0	....	1.3	....	1.8	....	10.0	....	5.0	....	160.0
12	1.65	5.5	....	1.2	....	1.6	1.95	15.0	....	5.0	....	80.0
13	....	5.0	....	1.2	....	1.4	....	13.5	....	5.0	1.8	9.0
14	....	4.0	1.23	1.2	1.24	1.3	....	12.0	....	5.0	....	8.0
15	1.50	3.0	....	1.0	....	1.3	1.84	10.6	....	5.0	....	7.0
16	....	3.0	....	0.5	....	1.2	....	12.2	1.65	5.5	1.7	6.5
17	....	3.0	0.67	0.3	1.23	1.2	....	13.8	....	9.0	....	110.0
18	....	3.0	....	0.3	....	1.2	....	15.4	1.90	13.0	....	215.0
19	1.47	2.7	....	0.3	....	1.1	2.0	17.0	....	15.0	3.8	320.0
20	....	2.0	....	0.3	1.20	1.1	....	60.0	....	17.0	....	260.0
21	....	2.0	0.7	0.3	....	1.1	....	100.0	....	19.0	....	200.0
22	....	2.0	....	0.6	....	1.1	2.9	140.0	....	21.0	....	140.0
23	1.38	1.9	....	0.9	1.20	1.1	....	114.0	2.1	23.0	2.6	80.0
24	....	1.8	1.2	1.1	....	1.1	....	88.0	....	31.0	....	66.0
25	....	1.8	....	1.1	....	1.1	2.5	62.0	2.3	39.0	....	51.0
26	1.35	1.7	....	1.2	....	1.1	....	102.0	....	34.0	....	37.0
27	....	1.7	1.22	1.2	....	1.1	2.9	140.0	....	29.0	....	23.0
28	1.35	1.7	....	1.2	1.20	1.1	....	120.0	....	24.0	1.8	9.0
29	....	1.0	....	1.2	....	1.5	....	100.0	....	19.0	....	8.0
30	....	1.0	....	1.3	....	2.6	....	80.0	1.9	13.0	1.7	6.5
31	....	1.0	1.25	1.3	....	....	....	60.0	....	....	....	6.0

Monthly Discharge of Brandt Creek above Young for 1915.

Month	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	23.0	3.0	8.8			
February	17.0	3.0	7.3			
March	100.0	4.5	21.0			
April	50.0	9.0	19.0			
May	39.0	11.0	21.0			
June	13.0	2.0	4.5			
July	5.5	1.0	2.4			
August	1.3	0.3	0.8			
September	6.5	1.1	1.8			
October	140.0	1.5	43.0			
November	50.0	4.5	21.0			
December	320.0	6.0	102.0			
The year	320.0	0.3	21.0			

CAPILANO CREEK.—(1023).

Location.—Just above the Vancouver intake, about 6 miles from the mouth of the creek.

Records Available.—Daily discharges from November, 1913, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Sixty-four square miles, estimated by the engineers of the Provincial Water Rights Branch.

Gauge.—Vertical gauge staff above intake. Daily gauge readings by Mr. Wm. Morrison, the caretaker of the city intake.

Channel.—Rocky bed, water swift in high stages. At low water a temporary dam is placed in the channel below the gauge, causing backwater. A subsidiary gauge has been installed for low water stages beyond the effect of this dam.

Discharge Measurements.—Fifteen discharge measurements taken in 1914 and 1915 give a well defined rating curve.

Winter Flow.—Open water all year.

Accuracy.—"C." A change in gauge was made in June, which will increase future accuracy.

Co-operation.—Gauge readings by employees of the Vancouver Waterworks department.

Discharge Measurements of Capilano Creek above City Intake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 13	Cline & Hughes	1521	67	300	4.90	5.95	1480
June 25	C. G. Cline	1505	85	97	1.80	2.00	176
June 11	C. G. Cline	1505	46	240	1.50	4.20	359
Aug. 4	C. G. Cline	1046	34	61	1.05	1.40	64
Dec. 22	Balls & Hughes	1046	66	320	2.75	3.25	866

NOTE.—New gauge installed above intake on August 4th.

Daily Gauge Height and Discharge of Capilano Creek above Intake for 1915.

(Drainage area, 64 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	8.0	4,620	5.8	1,320	4.8	540	10.5	9,620	4.2	310	4.7	490
2	5.8	1,320	5.1	710	4.6	450	9.9	8,420	4.5	410	4.5	410
3	5.7	1,210	4.6	450	4.3	340	7.0	2,950	5.1	710	4.5	410
4	4.9	590	4.2	310	4.8	540	5.9	1,430	5.1	710	4.4	375
5	4.2	310	4.7	490	4.6	450	5.5	1,000	5.2	770	4.8	540
6	4.2	310	6.3	1,920	5.9	1,430	5.4	920	5.3	840	4.7	490
7	4.9	590	5.2	770	4.9	590	6.4	2,060	5.4	920	4.4	375
8	6.0	1,540	5.0	650	4.4	375	5.9	1,430	5.2	770	4.3	340
9	5.0	650	5.6	1,100	4.2	310	5.2	770	5.1	710	4.4	375
10	5.1	710	5.1	710	4.2	310	5.0	650	6.0	1,540	4.1	280
11	6.2	1,790	4.7	490	4.2	310	5.2	770	5.3	840	4.2	310
12	5.1	710	4.3	340	4.1	280	5.8	1,320	5.3	840	4.2	310
13	4.4	375	4.3	340	4.2	310	5.8	1,320	4.9	590	4.2	310
14	4.7	490	4.0	250	8.2	5,020	5.5	1,000	5.1	710	2.3	310
15	4.2	310	4.0	250	7.7	4,110	5.4	920	5.0	650	2.3	310
16	4.1	280	4.0	250	5.9	1,430	5.6	1,100	4.5	410	2.3	310
17	4.0	250	6.2	1,790	5.4	920	5.7	1,210	4.3	340	2.3	310
18	3.9	225	5.0	650	6.0	1,540	5.7	1,210	4.8	540	2.2	270
19	4.0	250	4.4	375	5.3	840	5.7	1,210	5.0	650	2.1	240
20	4.2	310	4.2	310	5.4	920	5.2	770	4.9	590	2.2	270
21	4.0	250	4.2	310	6.1	1,660	4.8	540	4.7	490	2.1	240
22	4.0	250	4.6	450	6.0	1,540	4.7	490	4.6	450	2.1	240
23	3.9	225	5.0	650	5.8	1,320	4.7	490	4.5	410	2.1	240
24	3.9	225	5.0	650	5.4	920	4.8	540	4.9	590	2.1	240
25	3.8	200	5.5	1,000	4.9	590	4.4	375	5.8	1,320	2.0	210
26	3.6	160	4.8	540	4.6	450	4.6	450	5.4	920	2.0	210
27	3.7	180	4.7	490	4.2	310	4.6	450	5.9	1,430	1.9	180
28	3.7	180	5.2	770	4.3	340	4.4	375	5.4	920	1.8	150
29	3.7	180	....	....	5.0	650	4.6	450	4.9	590	1.9	180
30	3.8	200	....	....	6.2	1,790	4.4	375	4.5	410	2.0	210
31	5.6	1,100	....	....	5.6	1,100	....	....	4.6	450	....	....

	July.		August.		September.		October.		November.		December.	
1	2.0	210	1.4	65	1.4	65	1.2	45	....	1,220	2.4	350
2	2.0	210	1.4	65	1.5	80	2.4	350	....	720	2.7	480
3	1.9	180	1.4	65	1.4	65	1.7	130	2.8	530	4.9	2,800
4	1.9	180	1.4	65	1.3	55	1.5	80	2.9	590	5.0	2,930
5	1.9	180	1.4	65	1.3	55	1.4	65	3.0	650	4.3	2,000
6	1.8	150	1.3	55	1.3	55	1.3	55	2.6	430	4.2	1,880
7	1.7	130	1.3	55	1.2	45	1.3	55	2.4	350	3.3	860
8	1.9	180	1.3	55	1.4	65	1.3	55	2.3	310	8.6	8,620
9	2.0	210	1.3	55	1.6	110	1.2	45	2.1	240	4.1	1,750
10	1.8	150	1.3	55	1.5	80	1.2	45	2.1	240	3.2	780
11	1.8	150	1.3	55	1.4	65	1.2	45	2.1	240	2.9	590
12	1.9	180	1.3	55	1.3	55	2.2	270	2.1	240	3.1	710
13	2.0	210	1.3	55	1.2	45	4.05	1,730	2.1	240	3.2	780
14	1.8	150	1.3	55	1.2	45	3.15	750	2.2	270	2.8	530
15	1.8	150	1.3	55	1.2	45	2.3	310	2.5	390	2.5	390
16	1.9	180	1.3	55	1.2	45	1.9	180	2.6	430	2.4	350
17	1.9	180	1.3	55	1.2	45	1.8	150	3.7	1,230	2.3	310
18	1.7	130	1.3	55	1.2	45	2.8	530	2.8	530	2.3	310
19	1.7	130	1.2	45	1.2	45	2.8	530	2.6	430	2.2	270
20	1.6	110	1.2	45	1.2	45	covr'd	4,400	2.3	310	3.9	1,500
21	1.6	110	1.2	45	1.2	45	....	4,190	2.3	310	4.2	1,880
22	1.6	110	1.2	45	1.1	35	....	1,590	2.9	590	3.4	950
23	1.6	110	1.2	45	1.1	35	....	1,220	3.7	1,230	3.1	710
24	1.5	80	1.2	45	1.1	35	....	1,450	3.0	650	2.7	480
25	1.5	80	1.2	45	1.1	35	....	2,420	3.1	710	2.5	390
26	1.5	80	1.2	45	1.1	35	....	4,620	3.4	950	2.3	310
27	1.5	80	1.2	45	1.1	35	....	3,560	2.7	480	2.2	270
28	1.5	80	1.2	45	1.1	35	....	2,950	2.4	350	2.1	240
29	1.5	80	1.2	45	1.1	35	....	1,040	3.2	780	2.1	240
30	1.4	65	1.2	45	1.1	35	....	860	2.8	530	2.0	210
31	1.4	65	1.3	55	....	....	....	3,550	....	....	2.0	210

NOTE.—October 13 and 14 gauge covered, discharge taken from highwater gauge at intake.

Monthly Discharge of Capilano Creek above Intake for 1915.

(Drainage area, 64 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	4,620	160	645	10.08	11.62	39,700
February	1,920	250	655	10.23	10.65	36,400
March	5,020	280	1,022	15.97	18.41	62,800
April	9,620	375	1,487	23.21	25.89	88,500
May	1,540	310	704	11.00	12.68	43,300
June	540	150	305	4.77	5.32	18,100
July	210	65	138	2.16	2.49	8,480
August	65	45	53	0.83	0.96	3,260
September	110	35	50	0.78	0.87	2,980
October	4,620	45	1,200	18.76	21.63	73,800
November	1,230	240	540	8.44	9.42	32,100
December	8,620	210	1,100	17.19	19.81	67,600
The year	9,620	35	658	10.28	139.75	477,020

CHEHALIS RIVER.—(1003).

Location.—One and a half mile from mouth, in section 14, township 4, range 30, west of 6th meridian.

Records Available.—Daily discharges from March, 1912, to June 6, 1915. On this date the station was discontinued temporarily owing to the improbability of power development for a considerable time. (Records available for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Two hundred square miles.

Gauge.—Chain gauge. Daily gauge readings by Mr. H. Bahn, of Harrison Mills, B.C.

Channel.—Rock bed. The water is very swift at high stages and is not confined.

Discharge Measurements.—Eleven discharge measurements taken during 1912-13-14-15 give a well defined rating curve.

Winter Flow.—Open water all year.

Accuracy.—Below 3,000 cubic feet per second "B," above 3,000 cubic feet per second, "C."

Discharge Measurements of Chehalis River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 6	Cline & Hughes	1,521	110	273	2.30	3.7	623

Daily Gauge Height and Discharge of Chehalis River near Mouth for 1915.

(Drainage area, 200 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.0	470	3.3	670	3.65	940	4.3	1,550	3.4	750	....	....
2	3.8	1,060	3.35	710	3.5	820	5.8	6,700	3.35	710	....	....
3	4.9	2,750	3.5	820	3.4	750	5.1	3,450	3.3	670	....	....
4	4.1	1,320	3.6	900	3.35	710	4.8	2,450	3.3	670	....	....
5	3.9	1,140	3.65	940	3.4	750	4.6	2,000	3.3	670	....	....
6	3.85	1,100	3.75	1,020	3.45	780	4.4	1,670	3.4	750	....	....
7	3.8	1,060	3.85	1,100	3.4	750	4.3	1,550	3.5	820	....	....
8	3.75	1,020	3.9	1,140	3.3	670	4.6	2,000	3.55	860	....	....
9	3.9	1,140	3.8	1,060	3.25	630	5.0	3,100	3.6	900	....	....
10	3.95	1,180	3.8	1,060	3.25	630	4.8	2,450	3.7	980	....	....
11	4.60	2,000	3.75	1,020	3.3	670	4.7	2,200	3.8	1,060	....	....
12	4.40	1,670	3.7	980	3.35	710	4.6	2,000	3.7	980	....	....
13	4.30	1,550	3.6	900	3.35	710	4.5	1,820	3.7	980	....	....
14	4.10	1,320	3.6	900	4.0	1,230	4.5	1,820	3.6	900	......	....
15	3.95	1,180	3.6	900	5.5	5,300	4.45	1,740	3.55	860	....	....
16	3.80	1,060	3.5	820	5.0	3,100	4.45	1,740	3.55	860	....	....
17	3.65	940	3.4	750	4.8	2,450	4.3	1,550	3.50	820	....	....
18	3.55	860	3.5	820	4.6	2,000	4.3	1,550	3.45	780	....	....
19	3.50	820	3.6	900	4.5	1,820	4.2	1,430	3.45	780	....	....
20	3.55	860	3.7	980	4.4	1,670	4.15	1,380	3.50	820	....	....
21	3.50	820	3.75	1,020	4.4	1,670	4.1	1,320	3.60	900	....	....
22	3.45	780	3.7	980	4.45	1,740	4.0	1,230	3.65	940	....	....
23	3.40	750	3.65	940	4.4	1,670	3.9	1,140	3.7	980	....	....
24	3.35	710	3.6	900	4.3	1,550	3.8	1,060	3.6	900	....	....
25	3.35	710	3.6	900	4.2	1,430	3.75	1,020	3.55	860	....	....
26	3.35	710	3.65	940	4.1	1,320	3.7	980	3.5	820	....	....
27	3.30	670	3.7	980	4.15	1,380	3.6	900	3.65	940	....	....
28	3.25	630	3.75	1,020	4.0	1,230	3.5	820	4.3	1,550	....	....
29	3.20	600	....	....	3.9	1,140	3.45	780	4.0	1,230	....	....
30	3.20	600	....	....	4.0	1,230	3.4	750	3.9	1,140	....	....
31	3.3	670	....	....	4.05	1,280	....	....	3.8	1,060	....	....

Monthly Discharge of Chehalis River near Mouth for 1915.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	2,750	470	1,040	5.20	6.00	64,000
February	1,140	670	930	4.65	4.84	51,600
March	5,300	630	1,380	6.90	7.95	84,800
April	6,700	750	1,800	9.00	10.04	107,000
May	1,550	670	900	4.50	5.19	55,300
The period	6,700	470	1,210	6.05	34.02	362,700

NOTE.—Station discontinued May 31st, 1915.

CHILLIWACK RIVER.—(1004).

Location.—Five miles from Sumas lake, in section 1, township 23, east of the coast meridian.

Records Available.—Daily discharges from November, 1911, to December, 1915. (Records available for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Four hundred and fifty square miles, of which about 100 square miles are in the state of Washington.

Gauge.—Vertical staff on rock-filled crib. Daily gauge readings by Mr. A. N. Smith, of Vedder Crossing, B.C.

Channel.—Rocky bottom, good control, water deep; swift at high stages.

Discharge Measurements.—Sixteen meter measurements made during 1911-12-13-14-15, give a well defined rating curve.

Winter Flow.—Open water conditions all year.

Accuracy.—"A."

Discharge Measurements of Chilliwack River 5 Miles above Sumas Mt. for 1915.

Date	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 26	Cline and Hughes............	1,521	125	415	5.30	2.40	2,210

Daily Gauge Height and Discharge of Chilliwak River 5 Miles above Sumas Mt. for 1915.

(Drainage area, 450 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.4	1,000	1.2	850	1.2	850	1.9	1,550	2.2	2,000	2.8	3,000
2	1.65	1,250	1.15	820	1.25	880	3.8	4,800	2.3	2,150	2.7	2,800
3	1.8	1,400	1.15	820	1.25	880	5.0	8,700	2.3	2,150	2.7	2,000
4	1.8	1,400	1.1	800	1.2	850	4.0	5,300	2.4	2,300	2.8	3,000
5	1.75	1,350	1.1	800	1.25	880	3.4	4,000	2.5	2,500	2.9	3,150
6	1.65	1,250	1.15	820	1.3	900	3.1	3,500	2.6	2,650	3.0	3,300
7	1.5	1,100	1.1	800	1.3	900	3.4	4,000	2.6	2,650	3.9	3,150
8	1.4	1,000	1.1	800	1.25	880	3.5	4,200	2.7	2,800	2.7	2,800
9	1.5	1,100	1.15	820	1.25	880	3.4	4,000	2.7	2,800	2.6	2,650
10	1.5	1,100	1.15	820	1.2	850	3.3	3,850	2.6	2,650	2.5	2,500
11	1.7	1,300	1.2	850	1.15	820	3.4	4,000	2.6	2,650	2.5	2,500
12	1.7	1,300	1.25	880	1.15	820	3.3	3,850	2.5	2,500	2.4	2,300
13	1.65	1,250	1.3	900	1.2	850	3.1	3,500	2.6	2,650	2.3	2,150
14	1.6	1,200	1.3	900	1.2	850	2.9	3,150	2.6	2,650	2.2	2,000
15	1.5	1,100	1.25	880	2.2	2,000	2.6	2,650	2.5	2,500	2.3	2,150
16	1.4	1,000	1.2	850	2.1	1,850	2.7	2,800	2.5	2,500	2.4	2,300
17	1.4	1,000	1.3	900	2.0	1,700	2.8	3,000	2.6	2,650	2.5	2,500
18	1.4	1,000	1.3	900	1.9	1,550	2.9	3,150	2.7	2,800	2.4	2,300
19	1.35	950	1.25	880	2.0	1,700	2.9	3,150	2.8	3,000	2.3	2,150
20	1.3	900	1.25	880	2.1	1,850	2.8	3,000	2.9	3,150	2.2	2,000
21	1.3	900	1.2	850	2.2	2,000	2.7	2,800	2.9	3,150	2.25	2,070
22	1.25	870	1.15	820	2.3	2,150	2.7	2,800	2.8	3,000	2.2	2,000
23	1.2	850	1.15	820	2.5	2,500	2.6	2,650	2.7	2,800	2.15	1,920
24	1.2	850	1.2	850	2.2	2,000	2.6	2,650	2.6	2,650	2.1	1,850
25	1.2	850	1.2	850	2.1	1,850	2.5	2,500	2.5	2,500	2.1	1,850
26	1.2	850	1.25	880	2.0	1,700	2.4	2,300	2.5	2,500	2.05	1,770
27	1.15	820	1.3	900	1.9	1,550	2.3	2,150	2.6	2,650	2.0	1,700
28	1.15	820	1.25	880	1.8	1,400	2.3	2,150	3.4	4,000	2.0	1,700
29	1.1	800	....	....	1.8	1,400	2.4	2,300	3.2	3,700	1.95	1,620
30	1.1	800	....	....	1.7	1,300	2.3	2,150	3.0	3,300	1.95	1,620
31	1.15	820	....	....	1.6	1,200	....	....	2.9	3,150	....	....

	July.		August.		September.		October.		November.		December.	
1	2.20	2,000	1.40	1,000	1.3	900	1.2	850	4.3	6,100	1.7	1,300
2	2.25	2,080	1.35	950	1.3	900	1.55	1,150	3.6	4,400	1.8	1,400
3	2.30	2,150	1.40	1,000	1.25	875	1.55	1,150	3.2	3,700	1.9	1,550
4	2.30	2,150	1.45	1,050	1.25	875	1.3	900	3.0	3,300	2.0	1,700
5	2.25	2,080	1.50	1,100	1.20	850	1.3	900	3.3	3,850	2.1	1,850
6	2.20	2,000	1.50	1,100	1.25	875	1.25	875	3.0	3,300	2.2	2,000
7	2.15	1,920	1.60	1,200	1.30	900	1.25	875	2.8	3,000	2.3	2,150
8	2.15	1,920	1.60	1,200	1.30	900	1.2	850	2.6	2,650	4.2	5,800
9	2.10	1,850	1.60	1,200	1.35	950	1.2	850	2.4	2,300	3.8	4,800
10	2.00	1,700	1.55	1,150	1.30	900	1.15	825	2.3	2,150	2.9	3,150
11	2.00	1,700	1.55	1,150	1.25	875	1.15	825	2.2	2,000	2.7	2,800
12	1.95	1,620	1.50	1,100	1.25	875	1.50	1,100	2.1	1,850	2.5	2,500
13	2.00	1,700	1.50	1,100	1.25	875	1.50	1,100	2.0	1,700	2.4	2,300
14	2.05	1,780	1.45	1,050	1.20	850	1.45	1,050	1.8	1,400	2.3	2,150
15	2.00	1,700	1.45	1,050	1.25	875	1.45	1,050	1.8	1,400	2.2	2,000
16	2.00	1,700	1.45	1,050	1.20	850	1.35	950	1.9	1,550	2.2	2,000
17	1.95	1,620	1.40	1,000	1.20	850	1.30	900	2.0	1,700	2.0	1,700
18	1.90	1,550	1.45	1,050	1.20	850	1.50	1,100	2.4	2,300	1.9	1,550
19	1.85	1,480	1.50	1,100	1.15	825	1.70	1,300	2.3	2,150	1.8	1,400
20	1.85	1,480	1.50	1,100	1.15	825	2.40	2,300	2.2	2,000	1.8	1,400
21	1.80	1,400	1.45	1,050	1.1	800	2.30	2,150	2.1	1,850	2.7	2,800
22	1.75	1,350	1.45	1,050	1.1	800	2.00	1,700	2.1	1,850	3.0	3,300
23	1.70	1,300	1.45	1,050	1.15	825	1.90	1,550	2.2	2,000	2.6	2,650
24	1.70	1,300	1.50	1,100	1.2	850	2.00	1,700	2.3	2,150	2.2	2,000
25	1.65	1,250	1.50	1,100	1.2	850	3.00	3,300	2.6	2,650	2.2	2,000
26	1.65	1,250	1.45	1,050	1.2	850	3.25	3,775	2.5	2,500	2.1	1,850
27	1.60	1,200	1.45	1,050	1.15	825	3.60	4,400	2.3	2,150	2.1	1,850
28	1.55	1,150	1.4	1,000	1.15	825	5.15	9,350	2.2	2,000	2.0	1,700
29	1.50	1,100	1.4	1,000	1.15	825	4.00	5,300	2.1	1,850	1.9	1,550
30	1.50	1,100	1.35	950	1.2	850	3.40	4,000	1.9	1,550	1.7	1,300
31	1.40	1,000	1.35	950	....	....	4.95	8,500	......	....	1.7	1,300

Monthly Discharge of Chilliwak River 5 Miles above Sumas Mt. for 1915.

(Drainage area, 450 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,400	800	1,040	2.31	2.66	64,000
February	900	800	850	1.89	1.97	47,200
March	2,500	820	1,350	3.00	3.46	83,000
April	8,700	1,550	3,350	7.45	8.31	199,000
May	4,000	2,000	2,740	6.09	7.02	168,000
June	3,300	1,620	2,320	5.16	5.76	138,000
July	2,150	1,000	1,600	3.55	4.09	98,400
August	1,200	950	1,066	2.37	2.73	65,500
September	950	800	859	1.91	2.13	51,100
October	9,350	825	2,150	4.78	5.51	13,200
November	6,100	1,400	2,450	5.45	6.08	14,600
December	5,800	1,300	2,190	4.87	5.62	135,000
The year	9,350	800	1,830	4.07	55.34	1,077,000

COQUIHALLA RIVER.—(1005).

Location.—One mile from mouth, near Hope, in section 10, township 5, range 26, west of 6th meridian.

Records Available.—Daily discharges from November, 1911, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Three hundred and sixty square miles.

Gauge.—Cable gauge on highway bridge, also subsidiary cable gauge on C.N.R. trestle. The gauge reader is Mr. T. L. Thacker. The gauge on the C.N.R. trestle is read four or five times a week. The gauge on the highway bridge is read once or twice a week.

Channel.—Stream rather shallow, with rocky bottom; water swift at the higher stages.

Discharge Measurements.—Nineteen meter measurements were made during 1912-13-14-15, giving a well defined rating curve.

Winter Flow.—The section is affected by anchor ice at the riffle, although the stream never freezes over.

Accuracy.—"C." Gauge readings irregular.

Discharge Measurements of Coquihalla River at Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 10	H. C. Hughes	1,057	118	2.07	1.77	1.10	367
June 29	C. G. Cline	1,505	120	2.15	2.10	1.30	459
Dec. 18	H. C. Hughes	1,046	120	2.30	2.11	1.25	486

Daily Gauge Height and Discharge of Coquihalla River at Highway Bridge for 1915.

(Drainage area, 360 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	270	0.75	230	0 75	230	....	2,370	....	840	....	930
2	....	270	0.75	230	0.80	240	3.60	3,200	1.80	810	....	910
3	....	270	0.75	230	0.80	240	....	2,800	1.90	890	1.90	890
4	....	270	....	240	0.80	240	....	2,400	2.00	970	1.95	930
5	0.90	270	0.80	240	0.95	300	2.90	2,000	....	1,290	2.00	970
6	0.90	270	....	230	0.80	240	....	2,040	....	1,610	2.15	1,100
7	0.90	270	0.75	230	0.90	270	2.95	2,080	2.85	1,920	2.15	1,100
8	....	260	0.75	230	....	290	....	1,590	....	1,660	....	970
9	....	260	0.70	220	0.95	300	2.15	1,100	2.45	1,400	1.85	850
10	0.85	250	0.70	220	0.80	240	....	1,240	2.25	1,200	....	830
11	1.00	320	0.75	230	....	270	....	1,380	....	1,140	1.80	810
12	....	320	0.80	240	0.95	300	....	1,520	....	1,080	....	810
13	1.00	320	....	240	0.90	270	2.65	1,650	2.05	1,020	....	810
14	0.90	270	....	240	....	400	2.30	1,240	2.35	1,290	....	810
15	0.90	270	....	240	....	530	2.30	1,240	2.05	1,020	1.80	810
16	0.85	250	0.80	240	1.60	660	2.65	1,650	....	960	1.60	660
17	0.85	250	0.85	250	....	660	....	1,900	1.90	890	....	680
18	0.80	240	0.80	240	1.60	660	3.00	2,150	2.50	1,460	1.65	700
19	0.85	250	0.85	250	1.55	620	....	1,860	....	1,380	1.60	660
20	0.85	250	....	270	1.45	560	2.60	1,580	....	1,310	....	620
21	0.80	240	0 95	300	....	760	2.45	1,400	2.30	1,240	1.50	590
22	0.80	240	....	290	2.00	970	2.35	1,290	....	1,210	....	580
23	0.60	200	0.90	270	1.15	400	2.00	970	....	1,190	1.45	560
24	0.70	220	....	240	2.15	1,100	2.15	1,100	....	1,170	1.45	560
25	0.65	210	0.70	220	1.70	730	....	1,060	2.20	1,150	1.35	500
26	....	210	0.80	240	1.55	620	....	1,020	....	1,170	....	480
27	0.65	210	0.80	240	....	650	....	980	2.25	1,200	....	460
28	0.65	210	0.80	240	....	680	....	950	2.80	1,850	....	450
29	....	220	....	....	1.65	700	....	910	....	1,410	1.25	440
30	0.75	230	....	....	1.70	730	....	870	2.00	970	....	430
31	0.75	230	....	....	....	1,550	....	....	....	950	....	....

	July.		August.		September.		October.		November.		December.	
1	....	445	....	270	....	205	0.50	180	3.10	2,310	....	455
2	1.25	445	0.90	270	0.60	200	....	215	2.85	1,920	1.25	445
3	1.25	445	0.85	255	0.50	180	....	250	2.60	1,580	1.25	445
4	....	420	....	250	....	180	....	285	2.45	1,400	1.50	590
5	....	395	....	245	....	180	1.00	320	....	1,370	....	590
6	1.1	370	0.80	240	....	180	0.75	230	2.40	1,340	1.50	590
7	....	360	....	230	0.50	180	....	230	....	1,670	....	1,120
8	....	355	0.70	220	0.55	190	0.75	230	1.9	2,000	2.65	1,640
9	1.05	345	0.80	240	0.85	255	....	235	1.9	2,000	....	1,180
10	....	340	0.75	230	....	240	....	235	....	1,760	1.70	730
11	....	330	....	225	....	230	0.80	240	....	1,415	1.80	810
12	1.0	320	0.70	220	....	220	....	430	....	1,070	....	700
13	....	510	0.70	220	....	210	....	620	1.55	625	1.50	590
14	....	700	0.70	220	0.60	200	1.80	810	....	590	1.50	590
15	1.9	890	....	220	....	200	....	740	1.40	530	....	550
16	1.6	660	0.70	220	....	200	....	670	....	550	....	515
17	....	580	0.65	210	0.60	200	....	600	....	560	....	480
18	....	510	0.70	220	0.90	270	1.40	530	....	570	....	455
19	....	440	....	220	....	240	1.65	695	1.50	590	1.20	420
20	1.1	370	0.65	210	....	210	....	1,020	....	545	1.35	500
21	1.1	370	0.65	210	0.50	180	2.40	1,340	1.35	500	1.70	730
22	....	345	0.70	220	0.50	180	....	1,080	1.55	625	2.50	1,460
23	1.0	320	0.60	200	....	180	1.80	810	1.50	590	1.90	890
24	....	320	0.60	200	0.50	180	1.60	660	1.65	695	....	830
25	1.0	320	0.60	200	0.60	200	2.35	1,290	....	680	....	790
26	....	295	0.60	200	....	190	3.10	2,310	1.60	660	....	730
27	0.9	270	....	200	....	190	....	4,580	....	610	1.60	660
28	....	280	....	200	0.50	180	5.50	6,840	....	560	....	610
29	0.95	295	....	210	0.55	190	....	4,280	....	510	....	560
30	....	283	....	210	....	190	2.70	1,710	1.30	470	....	510
31	0.9	270	0.65	210	....	....	....	2,010	....	....	1.25	445

Monthly Discharge of Coquihalla River at Highway Bridge for 1915.
(Drainage area, 360 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	320	210	252	0.70	0.81	15,500
February	300	220	242	0.67	0.70	13,400
March	1,550	230	530	1.47	1.70	32,600
April	3,200	870	1,580	4.39	4.90	94,000
May	1,920	810	1,210	3.36	3.87	74,400
June	1,100	430	730	2.03	2.26	43,400
July	890	270	406	1.13	1.30	25,000
August	270	200	222	0.62	0.72	13,650
September	270	180	201	0.56	0.63	12,000
October	6,840	180	1,150	3.20	3.69	70,700
November	2,310	470	1,010	2.81	3.14	60,100
December	1,640	445	697	1.94	2.24	42,900
The year	6,840	180	686	1.91	25.96	497,650

COQUITLAM RIVER (1066).

Location.—One mile above mouth, in section 2, township 39, west of the coast meridian.

Records Available.—Daily discharges from January 25, 1915, to December, 1915.

Drainage Area.—One hundred and fifteen square miles above metering section. Taken from provincial map 1913—(scale—3 miles to the inch).

Gauge.—Chain gauge on highway bridge at Westminster Junction. The gauge is read daily by Mr. C. Galor.

Channel.—Gravelly bottom, good control, water dead at low stages.

Discharge Measurements.—Five discharge measurements taken in 1915 give a well defined rating curve.

Winter Flow.—The stream is affected by ice only in very cold weather, which occurs but seldom.

Accuracy.—"B."

COQUITLAM RIVER.—(1066).

Coquitlam river rises in Disappointment lake and flows in a southerly direction through Coquitlam lake, discharging into the Fraser river about three miles above New Westminster. The chief tributary is Gold creek, which enters about one and a half mile from the outlet of Coquitlam lake. The total drainage area is about one hundred and fifteen square miles.

A large part of the flow of Coquitlam river is diverted through a tunnel into lake Buntzen and from there carried down in penstocks to a power house situated on the north arm of Burrard Inlet, operated by the British Columbia Electric Railway Company.

The station is established at the highway bridge in the town of Port Coquitlam. The purpose of this station is to determine the maximum flow in the channel near Port Coquitlam. The river at this point overflows its banks during the freshets, and, apart from being a constant menace to public safety, renders a large tract of land practically useless. It is altogether probable that eventually this land will be reclaimed by controlling the flow of the stream.

Daily Gauge Height and Discharge of Coquitlam River at Westminster Jct. for 1915.

(Drainage area, 115 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	2.2	250	2.4	350	4.85	4,220	2.1	200	2.2	250
2	....	....	2.0	150	2.7	560	6.5	8,800	2.0	150	2.1	200
3	....	....	1.7	70	2.8	640	5.45	5,770	2.0	150	2.0	150
4	....	....	1.8	80	2.8	640	4.7	3,850	1.9	110	2.0	150
5	....	....	1.7	70	2.9	720	4.2	2,700	1.9	110	1.9	110
6	....	....	2.3	300	2.8	640	3.9	2,150	1.8	80	1.8	80
7	....	....	2.0	150	2.4	350	3.4	1,400	1.8	80	1.8	80
8	....	....	1.9	110	2.4	350	3.4	1,400	1.9	110	1.7	70
9	....	....	1.7	70	2.0	150	3.3	1,250	2.0	150	1.6	60
10	....	....	2.0	150	2.2	250	4.0	2,300	2.2	250	1.6	60
11	....	....	1.9	110	2.4	350	3.9	2,150	2.7	560	1.5	50
12	....	....	1.9	110	3.4	1,400	3.7	1,850	2.9	720	1.5	50
13	....	....	2.0	150	4.9	4,350	3.4	1,400	2.8	640	1.5	50
14	....	....	2.2	250	4.8	4,100	3.3	1,250	2.4	350	1.4	45
15	....	....	2.4	350	4.7	3,850	3.2	1,100	2.3	300	1.4	45
16	....	....	2.9	720	4.0	2,300	3.2	1,100	2.3	300	1.4	45
17	....	....	2.4	350	3.9	1,150	3.1	950	2.0	150	1.4	45
18	....	....	2.2	250	3.6	1,700	3.0	800	2.1	200	1.4	45
19	....	....	1.9	110	3.4	1,400	2.9	720	2.0	150	1.4	45
20	....	....	1.0	110	3.0	800	2.8	640	1.9	110	1.4	45
21	....	....	1.9	110	2.9	720	2.8	640	1.9	110	1.4	45
22	....	....	2.0	150	2.9	720	2.8	640	2.0	150	1.4	45
23	....	....	2.2	250	2.8	640	2.7	560	2.6	480	1.4	45
24	....	....	2.4	350	2.7	560	2.6	480	2.4	350	1.4	45
25	1.5	50	2.2	250	2.7	560	2.4	350	2.3	300	1.4	45
26	1.5	50	2.2	250	2.6	480	2.4	350	2.4	350	1.4	45
27	1.45	45	2.2	250	2.5	400	2.3	300	2.7	560	1.4	45
28	1.40	40	2.4	350	2.8	640	2.1	200	2.8	640	1.3	40
29	1.40	40	....	....	2.9	720	2.0	150	2.4	350	1.3	40
30	1.40	40	....	....	2.9	720	2.0	150	2.4	350	1.3	40
31	2.50	400	....	....	3.1	950	....	....	2.4	350	....	....

	July.		August.		September.		October.		November.		December.	
1	1.4	40	1.4	40	1.4	40	1.4	40	4.0	2,300	2.8	640
2	1.4	40	1.4	40	1.4	40	1.4	40	3.5	1,550	2.6	480
3	1.4	40	1.4	40	1.4	40	2.0	150	3.0	800	2.9	720
4	1.4	40	1.4	40	1.4	40	1.5	50	2.6	480	4.1	2,500
5	1.4	40	1.4	40	1.4	40	1.4	40	2.9	720	4.2	2,700
6	1.4	40	1.4	40	1.4	40	1.4	40	2.5	400	4.3	2,900
7	1.4	40	1.4	40	1.4	40	1.4	40	2.4	350	5.8	6,740
8	1.4	40	1.4	40	1.4	40	1.4	40	2.2	250	5.6	6,180
9	1.4	40	1.4	40	1.4	40	1.4	40	2.0	150	4.0	2,300
10	1.4	40	1.4	40	1.4	40	1.4	40	1.8	80	3.8	2,000
11	1.4	40	1.4	40	1.4	40	2.3	300	1.7	70	3.1	950
12	1.4	40	1.4	40	1.4	40	2.0	150	1.6	60	3.0	800
13	1.4	40	1.4	40	1.4	40	1.9	110	1.6	60	2.9	720
14	1.4	40	1.4	40	1.4	40	2.2	250	1.5	50	2.6	480
15	1.4	40	1.4	40	1.4	40	2.0	150	1.5	50	2.4	350
16	1.4	40	1.4	40	1.4	40	1.9	110	1.6	60	2.4	350
17	1.4	40	1.4	40	1.4	40	1.9	110	1.8	80	2.6	480
18	1.4	40	1.4	40	1.4	40	2.0	150	2.2	250	2.8	640
19	1.4	40	1.4	40	1.4	40	3.35	1,320	2.1	200	2.8	640
20	1.4	40	1.4	40	1.4	40	2.30	300	2.0	150	4.0	2,300
21	1.4	40	1.4	40	1.4	40	2.40	350	2.2	250	4.0	2,300
22	1.4	40	1.4	40	1.4	40	2.20	250	2.2	250	4.1	2,500
23	1.4	40	1.4	40	1.4	40	2.00	150	3.0	800	4.0	2,300
24	1.4	40	1.4	40	1.4	40	2.20	250	3.0	800	3.8	2,000
25	1.4	40	1.4	40	1.4	40	2.60	480	3.1	950	3.8	2,000
26	1.4	40	1.4	40	1.4	40	3.10	950	3.4	1,400	3.2	1,100
27	1.4	40	1.4	40	1.4	40	2.90	720	3.0	800	2.6	480
28	1.4	40	1.4	40	1.4	40	2.70	560	2.9	720	2.0	150
29	1.4	40	1.4	40	1.4	40	2.60	480	2.9	720	1.9	110
30	1.4	40	1.4	40	1.4	40	2.30	300	3.0	800	1.8	80
31	1.4	40	1.4	40	....	....	4.65	3,720	....	....	1.8	80

Discharge Measurements of Coquitlam River at Coquitlam Jct. for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 25	H. C. Hughes	1,933	52	26	1.53	1.50	40[1]
April 3	C. G. Cline	1,521	240	1,170	4.40	5.25	5,160[2]
April 15	Hughes & Cline	1,521	104	792	1.40	3.30	1,120[2]
June 21	C. G. Cline	1,505	42	25	1.70	1.35	43[3]
July 20	H. C. Hughes	1,046	11	6.5	3.70	1.35	20[4]

[1] Section 150 yards below gauge.
[2] Section at gauge.
[3] Section 100 yards below gauge.
[4] Section 120 yards below gauge.

Monthly Discharge of Coquitlam River at Westminster Junction for 1915.

(Drainage area, 115 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	....	....	....	....	....	....
February	720	70	210	1.82	1.90	11,700
March	4,350	150	1,100	9.57	11.03	67,600
April	8,800	150	1,650	14.35	16.01	98,200
May	720	80	286	2.49	2.87	17,600
June	250	40	70	0.61	0.68	4,160
July	40	40	40	0.35	0.40	2,460
August	40	40	40	0.35	0.40	2,460
September	40	40	40	0.35	0.39	2,380
October	3,720	40	377	3.28	3.78	23,200
November	2,300	50	520	4.52	5.04	30,900
December	6,740	80	1,550	13.50	15.60	95,300
The period	8,800	40	534	4.65	58.10	355,960

NOTE.—Station established in January, 1915.

FLUME CREEK.—(1062).

Location.—Five miles from Wigwam Inn, Indian river; and near the mouth of the stream.

Records Available.—Daily discharges from July, 1915, to December, 1915.

Drainage Area.—Not determined.

Gauge.—Vertical staff gauge. The gauge reader is Mr. J. L. Davis. Gauge readings are taken twice a week.

Channel.—Solid rock, good control.

Discharge Measurements.—Three discharge measurements were taken in 1915, giving a fairly well defined rating curve.

Winter Flow.—Fairly heavy snowfall, practically open conditions all winter.

Accuracy.—"D," because of infrequent gauge readings.

Co-operation.—Gauge readings are taken by the employees of the Westminster Power Company.

FLUME CREEK.—(1062).

Flume creek rises in the mountains to the west of the Mesliloet river and discharges into the Mesliloet river at an elevation of about 250 feet.

The annual precipitation in the Flume creek watershed is probably between 120 and 150 inches. In the higher altitudes there are snow fields which remain practically all the year.

With a fairly mild temperature in the lower altitudes, the stream is seldom frozen over and is seldom affected by ice for more than a few weeks during the coldest part of the winter.

The drainage basin of Flume creek is very rough and precipitous. The stream having a very rapid fall, a small quantity of power could be developed very cheaply. The watershed is heavily timbered with fir and cedar. During 1912 and 1913, the stream was used by the Hastings Shingle Company to provide water for a shingle bolt flume.

A metering station was established at the mouth by this survey in July, 1915 at the request of the Westminster Power Company.

Discharge Measurements of Flume Creek at Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 5	C. E. Dobbie	1,057	24	36.0	2.00	2.10	72.0
July 17	R. V. Gordon	1,505	25	20.5	0.88	0.60	18.0
July 26	R. V. Gordon	1,505	5	3.3	0.95	0.00	3.1

NOTE.—The metering section varies with the stage of the water.

Daily Gauge Height and Discharge of Flume Creek at Indian River for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	....	....	....	....	....	....	....	38
2	....	....	....	....	....	....	....	....	....	....	....	37
3	....	....	....	....	....	....	....	....	....	....	1.2	37
4	....	....	....	....	....	....	....	....	....	....	....	42
5	....	....	....	....	....	....	....	....	2.1	72	....	48
6	....	....	....	....	....	....	....	....	....	70	1.6	53
7	....	....	....	....	....	....	....	....	....	69	....	48
8	....	....	....	....	....	....	....	....	....	67	....	42
9	....	....	....	....	....	....	....	....	....	66	1.2	37
10	....	....	....	....	....	....	....	....	....	64	....	37
11	....	....	....	....	....	....	....	....	....	62	....	37
12	....	....	....	....	....	....	....	....	....	60	....	37
13	....	....	....	....	....	....	....	....	....	58	1.2	37
14	....	....	....	....	....	....	....	....	....	56	....	36
15	....	....	....	....	....	....	....	....	....	55	....	34
16	....	....	....	....	....	....	....	....	1.6	53	1.1	33
17	....	....	....	....	....	....	....	....	....	59	....	32
18	....	....	....	....	....	....	....	....	....	64	....	32
19	....	....	....	....	....	....	....	....	....	70	....	31
20	....	....	....	....	....	....	....	....	2.2	76	....	31
21	....	....	....	....	....	....	....	....	....	67	1.0	30
22	....	....	....	....	....	....	....	....	....	58	....	30
23	....	....	....	....	....	....	....	....	1.5	49	....	30
24	....	....	....	....	....	....	....	....	....	58	1.0	30
25	....	....	....	....	....	....	....	....	....	67	....	28
26	....	....	....	....	....	....	....	....	2.2	76	....	26
27	....	....	....	....	....	....	....	....	....	66	0.80	24
28	....	....	....	....	....	....	....	....	....	57	....	23
29	....	....	....	....	....	....	....	....	....	48	....	22
30	....	....	....	....	....	....	....	....	1.25	39	....	20
31	....	....	....	....	....	....	....	....	....	39	....	....

	July.		August.		September.		October.		November.		December.	
1	....	18	....	2	−1.3	2	....	5	2.5	88	....	90
2	0.60	17	−0.03	2	....	2	....	7	....	78	3.3	120
3	....	16	....	2	....	2	....	9	....	69	....	106
4	0.50	14	....	2	....	3	....	11	1.8	60	....	93
5	....	15	....	2	0.0	3	0.5	14	....	57	2.3	80
6	....	16	−0.03	2	....	3	....	11	....	53	....	110
7	....	16	....	2	....	3	....	8	....	49	....	140
8	0.60	17	....	2	....	3	0.1	5	1.40	45	4.5	168
9	....	20	−0.03	2	....	3	....	19	....	35	....	141
10	....	23	....	2	....	3	....	33	....	26	....	114
11	....	25	....	2	0.0	3	1.45	47	0.60	17	....	87
12	0.90	27	....	2	....	2	....	43	....	19	1.8	60
13	....	25	....	2	−0.15	2	....	39	....	21	....	50
14	....	23	−0.03	2	....	2	....	34	....	22	....	40
15	....	21	....	2	....	1	....	29	0.80	24	1.0	30
16	....	19	−0.08	2	−0.18	1	0.80	24	....	29	....	41
17	0.60	17	....	2	....	1	....	54	....	35	....	52
18	....	16	....	2	....	1	2.40	84	1.30	41	....	64
19	....	14	....	2	−0.25	1	....	119	....	48	2.2	76
20	......	12	....	1	....	1	....	154	....	55	....	85
21	....	11	−0.25	1	....	1	5.00	188	....	62	....	94
22	....	9	....	1	−0.25	1	....	175	2.00	68	2.9	104
23	....	7	−0.33	0	....	1	....	162	....	76	....	89
24	....	5	....	0	....	0	4.00	148	2.40	84	....	72
25	0.00	3	....	0	....	0	....	168	....	74	....	55
26	0.00	3	−0.33	0	....	0	5.00	188	.....	63	....	38
27	....	2	....	0	−0.30	0	....	171	....	52	0.7	21
28	....	2	....	1	....	1	....	154	....	41	....	20
29	−0.02	2	....	1	....	2	....	137	1.00	30	....	19
30	....	2	−0.1	2	0.02	3	....	120	....	60	....	18
31	....	2	....	2	....	....	....	103	.....	....	0.60	17

Monthly Discharge of Flume Creek at Mouth near Indian River for 1915.

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	53	20	34	....	....	....
July	27	2	14	....	....	....
August	2	0	2	....	....	....
September	3	0	2	....	....	....
October	188	5	80	....	....	....
November	88	17	49	....	....	....
December	168	17	74	....	....	....
The period	188	0	36	....	....	....

Note.—Station established May, 1915.

FRASER RIVER AT HOPE.—(1007).

Location.—At Hope, in section 16, township 5, range 26, west of 6th meridian.

Records Available.—Daily discharges from March, 1912, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Above gauging station 85,600 square miles; above mouth 90,000 square miles.

Gauge.—Painted on rock bluff at Kettle Valley Railway bridge; readings daily. Daily gauge readings by Mr. F. Nicholson, of Hope, B.C.

Channel.—About 900 feet wide, permanent, swift at higher stages.

Discharge Measurements.—Eleven meter measurements made during 1912-13-14-15, give a well defined rating curve. Some of these measurements were made by using floats.

Winter Flow.—Not enough ice to affect the gauge height-discharge relations.

Accuracy.—"B."

Co-operation.—Gauge readings taken by the engineers of the Kettle Valley Railroad.

Discharge Measurements of Fraser River at Hope for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 31	H. C. Hughes	1,521	711	16,800	2.1	12.2	35,200
July 2	C. G. Cline	1,505	855	24,490	8.1	21.8	199,000
Oct 31	H. C. Hughes	1,046	804	20,000	4.2	15.6	84,100
Dec. 17	H. C. Hughes	1,046	705	15,500	1.7	11.25	26,500

Note.—Readings taken at Kettle Valley Ry. bridge.

Daily Gauge Height and Discharge of Fraser River at Hope for 1915.

(Drainage area, 85,600 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	12.3	38,300	10.9	25,300	10.45	22,200	12.6	41,600	16.5	97,500	21.3	185,700
2	12.1	36,100	10.9	25,300	10.5	22,500	13.5	52,500	16.6	99,200	20.8	176,000
3	12.2	37,200	11.0	26,000	10.5	22,500	14.2	61,800	16.5	97,500	20.3	166,000
4	12.1	36,100	11.1	26,900	10.5	22,500	13.85	57,000	16.7	100,900	20.0	160,000
5	12.0	35,000	11.2	27,800	10.5	22,500	13.7	55,100	16.7	100,900	20.0	160,000
6	11.9	34,100	11.2	27,800	10.5	22,500	15.0	73,000	16.7	100,900	20.1	162,000
7	11.8	33,200	11.2	27,800	10.5	22,500	16.2	92,400	17.7	118,600	20.0	160,000
8	11.8	33,200	11.3	28,700	10.5	22,500	16.52	97,800	18.0	124,000	20.3	166,000
9	11.7	32,300	11.3	28,700	10.5	22,500	16.25	93,200	18.75	137,500	19.95	159,100
10	12.8	43,800	11.3	28,700	10.5	22,500	15.9	87,400	18.55	133,900	19.8	156,400
11	12.0	35,000	11.3	28,700	10.5	22,500	15.9	87,400	18.45	132,100	19.5	151,000
12	12.0	35,000	11.3	28,700	10.5	22,500	15.9	87,400	18.8	138,400	19.7	154,600
13	12.0	35,000	11.3	28,700	10.5	22,500	15.7	84,200	19.5	151,000	19.5	151,000
14	11.8	33,200	11.3	28,700	10.6	23,200	15.5	81,000	20.0	160,000	19.3	147,400
15	11.6	31,400	11.25	28,200	10.7	23,900	15.9	87,400	19.8	156,400	19.0	142,000
16	11.5	30,500	11.2	27,800	10.8	24,600	16.0	89,000	19.2	145,600	19.3	147,400
17	11.4	29,600	11.2	27,800	10.8	24,600	16.4	95,800	19.0	142,000	19.4	149,200
18	11.5	30,500	11.2	27,800	10.9	25,300	16.7	100,900	19.2	145,600	19.5	151,000
19	11.5	30,500	11.2	27,800	11.0	26,000	16.8	102,600	19.6	152,800	19.6	152,800
20	11.5	30,500	11.2	27,800	11.2	27,800	16.9	104,300	19.7	154,600	20.5	170,000
21	11.4	29,600	11.0	26,000	11.45	30,000	17.0	106,000	19.6	152,800	21.0	180,000
22	11.2	27,800	10.95	25,600	11.2	27,800	17.0	106,000	19.8	156,400	21.0	180,000
23	11.1	26,900	10.75	24,200	12.4	39,400	17.5	115,000	20.1	162,000	20.6	172,000
24	11.1	26,900	10.5	22,500	12.4	39,400	16.75	101,700	20.5	170,000	20.7	174,000
25	11.0	26,000	10.45	22,200	12.4	39,400	16.8	102,600	20.6	172,000	20.1	162,000
26	11.0	26,000	10.4	21,800	12.35	38,800	16.65	100,000	21.1	181,900	19.7	154,600
27	11.0	26,000	10.4	21,800	12.37	39,100	16.65	100,000	21.7	193,300	19.7	154,600
28	10.9	25,300	10.4	21,800	12.35	38,800	16.45	96,600	21.4	187,600	20.5	170,000
29	10.9	25,300	....	....	12.4	39,400	16.47	97,000	21.4	187,600	20.8	176,000
30	10.9	25,300	....	....	12.5	40,500	16.5	97,500	21.5	189,500	21.7	193,300
31	10.8	24,600	....	....	12.55	41,000	....	....	21.4	187,600	....	....

	July.		August.		September.		October.		November.		December.	
1	22.00	199,000	20.40	168,000	16.50	97,500	12.50	40,500	15.0	73,000	10.4	21,800
2	21.70	193,300	20.10	162,000	16.35	94,900	12.40	39,400	15.0	73,000	10.4	21.800
3	21.60	191,400	20.10	162,000	16.20	92,400	12.40	39,400	14.9	71,600	10.3	21,100
4	21.15	182,800	19.90	158,200	16.00	89,000	12.30	38,300	14.7	68,800	10.4	21,800
5	20.75	175,000	19.85	157,300	15.80	85,800	12.15	36,700	14.7	68,800	10.5	22,500
6	20.40	168,000	19.75	155,500	15.65	83,400	12.10	36,100	14.5	66,000	10.6	23,200
7	20.65	173,000	19.57	152,300	15.40	79,400	12.0	35,000	13.9	57,700	10.9	25,300
8	20.65	173,000	19.00	142,000	15.15	75,400	12.1	36,100	13.4	51,200	11.1	26,900
9	20.30	166,000	18.80	138,400	15.00	73,000	12.0	35,000	13.0	46,000	11.0	26,000
10	20.25	165,000	18.40	131,200	14.80	70,200	12.1	36,100	12.9	44,900	10.8	24,600
11	20.10	162,000	18.00	124,000	14.30	63,200	12.0	35,000	12.7	42,700	10.5	22,500
12	21.15	182,800	18.00	124,000	13.70	55,100	12.2	37,200	12.4	39,400	10.5	22,500
13	21.30	185,700	18.10	125,800	13.35	50,500	12.0	35,000	12.0	35,000	10.4	21,800
14	22.30	204,700	18.00	124,000	13.00	46,000	11.8	33,200	12.0	35,000	10.3	21,100
15	22.20	202,800	17.80	120,400	12.80	43,800	11.75	32.700	12.0	35,000	10.1	19,700
16	21.55	190,400	17.60	116,800	12.80	43,800	12.00	35,000	11.9	34,100	10.0	19,000
17	21.10	181,900	17.80	120,400	12.90	44,900	12.0	35,000	11.9	34,100	9.8	17,600
18	21.20	183,800	18.00	124,000	12.90	44,900	12.1	36,100	11.8	33,200	9.6	16,200
19	21.40	187,600	17.50	115,000	13.00	46,000	12.4	39,400	11.8	33,200	9.5	15,500
20	20.80	176,000	17.90	122,200	13.00	46,000	12.7	42,700	11.6	31,400	10.0	19,000
21	21.40	187,600	18.00	124,000	13.20	48,600	12.9	44,900	11.8	33,200	10.6	23,200
22	21.10	181,900	18.20	127,600	13.35	50,500	13.0	46,000	11.6	31,400	10.4	21,800
23	20.80	176,000	18.20	127,600	13.50	52,500	13.0	46,000	11.5	30,500	10.3	21,100
24	20.50	170,000	18.10	125,800	13.30	49,900	13.0	46,000	11.5	30,500	10.3	21,100
25	20.50	170,000	18.00	124,000	13.00	46,000	12.9	44,900	11.4	29,600	10.1	19,700
26	20.35	167,000	17.80	120,400	13.00	46,000	13.0	46,000	11.2	27,800	10.1	19,700
27	20.15	163,000	17.80	120,400	12.80	43,800	14.0	59,000	11.0	26,000	10.1	19,700
28	20.00	160,000	17.60	116,800	12.75	43,300	16.0	89,000	10.9	25,300	9.9	18,300
29	19.90	158,200	17.30	111,400	12.60	41,600	15.0	73,000	10.7	23,900	9.7	16,900
30	19.90	158,200	17.00	106,000	12.50	40,500	15.5	81;000	10.6	23,200	9.5	15,500
31	20.00	160,000	16.70	100,900	....	....	15.5	81,000	....	....	9.3	14,100

Monthly Discharge of Fraser River at Hope for 1915.

(Drainage area, 85,600 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	43,800	24,600	31,300	0.37	0.43	1,925,000
February	28,700	21,800	26,500	0.31	0.32	1,470,000
March	41,000	22,200	28,400	0.33	0.38	1,746,000
April	115,000	41,600	88,500	1.03	1.15	5,266,000
May	193,300	97,500	146,000	1.71	1.97	8,980,000
June	193,300	142,000	162,800	1.90	2.12	9,690,000
July	204,700	158,200	177,300	2.07	2.39	10,902,000
August	168,000	100,900	130,600	1.52	1.75	8,030,000
September	97,500	40,500	59,600	0.70	0.78	3,546,000
October	81,000	32,700	44,900	0.52	0.60	2,760,000
November	73,000	23,200	41,900	0.49	0.55	2,493,000
December	26,900	14,100	20,700	0.24	0.28	1,273,000
The year	204,700	14,100	79,900	0.93	12.72	58,081,000

HIXON CREEK ABOVE BELKNAP CREEK.—(1064).

Location.—About 1 mile above the mouth of Belknap creek, in section 36, township 6, range 7, west of the 7th meridian.

Records Available.—Daily discharges from April to September, 1914, and from May to December, 1915. (Records for 1915 are given herein, for 1914 records see previous report.)

Drainage Area.—Not determined.

Gauge.—Vertical staff, nailed to tree. Gauge readings are taken twice a week by Mr. J. L. Davis.

Channel.—Rock and gravel with natural log weir as control.

Discharge Measurements.—Seven discharge measurements taken during 1913-14-15, give a well defined rating curve.

Winter Flow.—Very heavy snowfall, and some ice in winter.

Accuracy.—"D," because of infrequency of gauge readings (about twice a week).

Co-operation.—Gauge readings taken by the employees of the Westminster Power Company.

Discharge Measurements of Hixon Creek above Belknap for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 10	C. E. Dobbie	1,057	21	32.0	1.60	1.65	53.0[1]
July 22	R. V. Gordon	1,505	30	9.2	0.53	0.50	4.9[2]
Nov. 10	H. C. Hughes	1,046	24	17.8	0.33	0.79	5.9[1]

[1] Section at gauge.

[2] Section above gauge.

Daily Gauge Height and Discharge of Hixon Creek above Belknap for 1915.

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	16	....	4	....	5	0.6	4.5	....	30.0	....	24.0
2	1.10	16	....	4	0.9	7	....	4.5	1.2	22.0	....	39.0
3	....	16	0.44	4	....	6	....	4.5	....	28.0	1.6	54.0
4	....	16	....	4	....	6	....	5.4	....	33.0	....	48.0
5	1.10	16	....	3.5	....	5	....	5.4	1.4	38.0	....	43.0
6	....	20	0.40	3.5	0.5	4	0.74	5.4	....	31.0	1.4	38.0
7	....	24	....	3.5	....	4	....	4.0	....	24.0	....	55.0
8	....	28	....	3.5	....	4	....	4.0	....	18.0	....	72.0
9	1.30	30	....	3.5	....	5	0.34	3.0	....	12.0	2.0	89.0
10	....	22	....	3	0.7	5	....	4.0	0.80	6.0	....	70.0
11	....	16	0.35	3	....	5	....	5.0	....	6.0	....	52.0
12	....	10	....	3	....	4	0.80	6.0	....	6.0	....	34.0
13	0.60	4.5	....	3	....	3	....	5.0	....	6.0	1.1	16.0
14	....	4	0.36	3	0.3	3	....	5.0	....	6.5	....	14.0
15	....	4	....	3	....	3	0.55	4.2	....	6.5	....	12.0
16	....	4	....	3	....	3	....	13.0	0.85	6.5	1.0	10.0
17	....	4	0.35	3	0.3	3	....	22.0	....	14.0	....	17.0
18	....	4	....	3	....	3	....	30.0	1.20	22.0	....	24.0
19	....	4	....	3	....	3	1.40	38.0	....	28.0	....	31.0
20	....	4	....	3	0.3	3	....	52.0	....	34.0	1.4	38.0
21	0.50	4	0.32	3	....	3	....	66.0	....	40.0	....	43.0
22	0.50	4	....	3	....	3	1.90	80.0	....	47.0	....	48.0
23	....	4	....	3	0.3	3	....	72.0	1.60	54.0	1.6	54.0
24	....	4	0.30	3	....	3	....	63.0	....	62.0	....	44.0
25	....	4	....	3	....	3	1.60	54.0	1.80	71.0	....	34.0
26	....	4	....	3	....	2	....	62.0	....	58.0	....	24.0
27	0.48	4	0.35	3	....	2	1.80	71.0	....	46.0	....	14.0
28	....	4	....	3	0.2	2	....	62.0	....	34.0	0.6	4.5
29	....	4	....	3	....	2	....	54.0	....	22.0	....	4.0
30	....	4	....	3	....	3	....	46.0	1.0	10.0	0.5	4.0
31	....	4	0.28	3	....	....	....	38.0	....	....	....	4.0

Monthly Discharge of Hixon Creek above Belknap for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	30	4	10	....	....	....
July	4	3	3	....	....	....
August	7	2	4	....	....	....
September	80	3	29	....	....	....
October	71	6	27	....	....	....
November	54	4	34	....	....	....
The period	80	2	17.8	....	....	....

Note.—This station re-established in July.

JONES CREEK.—(1010).

Location.—At outlet of Jones lake, in section 28, township 3, range 27, west of the 6th meridian.

Records Available.—Daily discharges from April, 1911, to December, 1915. (Records for 1915 are given herein; preceding records are given in previous reports).

Drainage Area.—Twenty five square miles, determined by triangulation survey by Anderson & Warden, civil engineers, Vancouver, B.C.

Gauge.—Vertical staff fastened to rock-filled crib. Daily gauge readings by Mr. R. Barr, of Ruby Creek, B.C.

Channel.—Uniform section, deep water, good control.

Discharge Measurements.—Six discharge measurements made during 1911-12-13-14-15, give a well defined rating curve.

Winter Flow.—Open water practically all winter.

Accuracy.—"A."

Co-operation.—The records of this stream are kept by Anderson & Warden, civil engineers for the Vancouver Power Company.

Discharge Measurements of Jones Creek at Jones Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 23	C. G. Cline & H. C. Hughes....	1,521	51	119	1.10	1.02	127

Daily Gauge Height and Discharge of Jones Creek at Jones Lake for 1915.

(Drainage area, 25 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.55	55	0.40	45	0.40	45	0.85	92	0.80	85	1.35	200
2	0.60	60	0.40	45	0.40	45	1.55	255	0.80	85	1.30	190
3	0.65	65	0.40	45	0.40	45	2.30	495	0.80	85	1.20	165
4	0.65	65	0.40	45	0.40	45	2.10	425	0.80	85	1.20	165
5	0.65	65	0.45	47	0.45	47	1.80	325	0.80	85	1.20	165
6	0.60	60	0.45	47	0.45	47	1.60	270	0.90	100	1.30	190
7	0.55	55	0.45	47	0.45	47	1.50	240	1.00	120	1.35	200
8	0.55	55	0.45	47	0.45	47	1.45	230	1.05	130	1.30	190
9	0.55	55	0.45	47	0.40	45	1.30	190	1.05	130	1.20	165
10	0.55	55	0.45	47	0.40	45	1.25	180	1.10	140	1.15	150
11	0.60	60	0.45	47	0.40	45	1.20	165	1.10	140	1.20	165
12	0.65	65	0.40	45	0.40	45	1.15	150	1.05	130	1.20	165
13	0.60	60	0.45	47	0.40	45	1.20	165	1.00	120	1.20	165
14	0.60	60	0.45	47	0.45	47	1.20	165	1.05	130	1.15	150
15	0.60	60	0.45	47	0.70	70	1.15	150	1.10	140	1.10	140
16	0.50	50	0.45	47	0.75	78	1.15	150	1.05	130	1.10	140
17	0.50	50	0.45	47	0.80	85	1.15	150	1.00	120	1.30	190
18	0.50	50	0.45	47	0.80	85	1.15	150	1.10	140	1.30	190
19	0.50	50	0.45	47	0.80	85	1.20	165	1.30	190	1.20	165
20	0.45	47	0.45	47	0.80	85	1.20	165	1.45	230	1.15	150
21	0.45	47	0.45	47	0.80	85	1.15	150	1.40	215	1.10	140
22	0.45	47	0.40	45	0.90	100	1.10	140	1.35	200	1.10	140
23	0.45	47	0.40	45	0.95	110	1.00	120	1.30	190	1.10	140
24	0.40	45	0.40	45	1.00	120	1.00	120	1.25	175	1.15	150
25	0.40	45	0.45	47	0.95	110	0.95	110	1.25	175	1.10	140
26	0.40	45	0.40	45	0.90	100	0.90	100	1.20	165	1.10	140
27	0.40	45	0.40	45	0.85	92	0.90	100	1.20	165	1.05	130
28	0.40	45	0.40	45	0.80	85	0.90	100	1.55	255	1.10	140
29	0.40	45	....	....	0.80	85	0.90	100	1.50	240	1.00	120
30	0.40	45	....	....	0.85	92	0.85	92	1.40	215	1.00	120
31	0.40	45	....	....	0.85	92	....	....	1.30	190	....	....

	July.		August.		September.		October.		November.		December.	
1	1.10	140	1.10	140	0.85	92	0.50	50	1.95	375	0.75	77
2	1.20	165	1.10	140	0.80	85	0.75	77	1.70	295	0.70	70
3	1.25	178	1.10	140	0.80	85	0.75	77	1.55	255	0.70	70
4	1.30	190	1.05	130	0.80	85	0.70	70	1.40	215	0.80	85
5	1.30	190	1.00	120	0.80	85	0.70	70	1.45	227	0.85	92
6	1.30	190	1.00	120	0.75	78	0.70	70	1.35	202	0.85	92
7	1.25	178	0.95	110	0.70	70	0.60	60	1.25	177	0.80	85
8	1.20	165	0.90	100	0.70	70	0.60	60	1.15	152	1.10	140
9	1.20	165	0.90	100	0.75	78	0.55	55	1.10	140	1.45	227
10	1.15	152	0.90	100	0.70	70	0.50	50	1.00	120	1.30	190
11	1.10	140	0.90	100	0.70	70	0.50	50	1.00	120	1.20	165
12	1.05	130	0.90	100	0.60	60	0.60	60	0.90	100	1.10	140
13	1.05	130	0.90	100	0.60	60	0.65	65	0.90	100	1.00	120
14	1.00	120	0.90	100	0.60	60	0.80	85	0.80	85	0.95	110
15	1.10	140	0.90	100	0.60	60	0.75	77	0.85	92	0.90	100
16	1.20	165	0.90	100	0.60	60	0.70	70	0.85	92	0.85	92
17	1.10	140	0.95	110	0.60	60	0.65	65	0.80	85	0.85	92
18	1.10	140	0.90	100	0.60	60	0.70	70	0.85	92	0.80	85
19	1.10	140	0.90	100	0.60	60	0.95	110	0.90	100	0.80	85
20	1.10	140	1.00	120	0.60	60	1.20	165	0.90	100	0.70	70
21	1.15	152	1.00	120	0.60	60	1.50	240	0.85	92	1.10	140
22	1.15	152	1.05	130	0.60	60	1.35	202	0.80	85	1.30	190
23	1.10	140	1.05	130	0.60	60	1.25	177	0.85	92	1.20	165
24	1.10	140	1.05	130	0.60	60	1.20	165	0.80	85	1.10	140
25	1.10	140	1.05	130	0.60	60	1.40	215	0.90	100	1.05	130
26	1.10	140	1.00	120	0.60	60	1.55	255	0.90	100	1 00	120
27	1.10	140	0.95	110	0.60	60	2.00	390	0.85	92	1.00	120
28	1.10	140	0.90	100	0.60	60	2 50	565	0.80	85	1.00	120
29	1.05	130	0.90	100	0.50	50	2 20	460	0.80	85	0 95	110
30	1.10	140	0.95	110	0.50	50	1 85	342	0 80	85	0 90	100
31	1.10	140	0 90	100	....	....	2 00	390			0 80	85

Monthly discharge of Jones Creek at Jones Lake for 1915.

(Drainage area, 25 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	65	45	53	2.12	2.44	3,260
February	47	45	46	1.84	1.92	2,550
March	120	45	71	2.84	3 27	4,370
April	495	92	180	7.21	8.04	10,700
May	255	85	152	6.07	7.00	9,350
June	200	120	159	6.35	7 08	9,460
July	190	120	150	6.00	6.92	9,220
August	140	100	113	4.52	5.21	6,950
September	92	50	66	2.64	2.95	3,930
October	565	50	157	6.28	7 24	9,650
November	375	85	134	5.36	5.97	7,970
December	227	70	116	4.64	5.35	7,130
The period	565	45	116	4.66	63.39	84,540

LYNN CREEK.—(1046).

Location.—Below the overflow from the North Vancouver intake, and about 4 miles from the mouth of the stream.

Records Available.—Daily discharges from June, 1914, to December, 1915. (Records for 1915 are given herein; for 1914 records see previous report.)

Drainage Area.—Fourteen square miles, estimated by the engineers of the Provincial Water Rights Branch.

Gauge.—Cable gauge on flume bridge. Gauge read twice daily by Mr. J. Kirkland, caretaker of the North Vancouver intake.

Channel.—Boulders and solid rock.

Discharge Measurements.—Five measurements made during 1915 give a well defined rating curve.

Winter Flow.—Open water all year.

Accuracy.—"C."

Co-operation.—Gauge readings taken by the employees of the waterworks department of North Vancouver.

Discharge Measurements of Lynn Creek below Intake for 1915.

Date.	Engineer.	Meter No	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 9	C. G. Cline	1,521	41	70.1	2.30	5.52	165.0
June 1	Cline & Gordon	1,505	29	56.9	1.56	5.00	88.7
June 24	C. G. Cline	1,505	23	20.2	0.90	4.12	18.0
Aug. 3	C. G. Cline	1,046	22	14.2	0.45	3.85	6.5
Aug. 13	C. G. Cline	1,057	14	11.2	0.30	3.48	3.2

Daily Gauge Height and Discharge of Lynn Creek below City Intake for 1915.

(Drainage area, 14 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	5.15	108	4.7	57	5.7	200	5.95	243	4.7	57	5.0	90
2	5.45	158	4.8	57	5.5	165	9.60	1,200	4.6	49	5.2	115
3	5.60	180	5.0	90	5.5	165	7.05	462	4.95	83	5.5	165
4	5.10	102	4.9	77	5.75	208	5.95	243	5.2	115	5.1	102
5	5.00	90	5.1	102	5.55	173	5.4	150	5.5	165	4.8	67
6	4.90	77	5.5	165	5.2	115	5.3	130	5.5	165	4.7	57
7	5.30	130	5.55	173	5.4	150	5.7	200	5.75	208	4.75	62
8	5.45	158	5.7	200	5.8	215	5.95	243	5.7	200	4.6	49
9	5.40	150	5.8	215	6.3	305	5.6	180	5.9	235	4.55	45
10	5.20	115	5.75	208	6.0	250	5.1	102	5.9	235	4.9	77
11	5.10	102	5.95	243	5.9	235	4.9	77	5.9	235	4.95	83
12	5.50	165	5.95	243	5.7	200	5.4	150	5.9	235	5.0	90
13	5.65	190	5.5	165	5.5	165	5.85	225	6.1	270	5.0	90
14	5.60	180	5.4	150	5.3	130	6.05	260	6.3	305	4.95	83
15	5.00	90	5.3	130	5.0	90	6.0	250	6.0	250	4.9	77
16	4.75	62	5.5	165	5.3	130	5.75	208	5.9	235	4.85	72
17	4.2	22	5.4	150	5.75	208	5.3	130	5.8	215	4.8	67
18	4.2	22	5.25	123	5.55	173	5.2	115	5.75	208	4.7	57
19	4.0	13	5.5	165	5.10	102	5.0	90	5.9	235	4.5	41
20	4.0	13	5.75	208	4.9	77	4.95	83	5.7	200	4.3	27
21	4.0	13	5.7	200	5.1	102	4.95	83	5.1	102	4.3	27
22	4.75	62	5.75	208	5.4	150	5.10	102	4.95	83	4.3	27
23	5.50	165	5.95	243	5.3	130	5.50	165	5.0	90	4.25	25
24	5.75	208	5.9	235	5.2	115	5.3	130	6.1	270	4.15	20
25	6.10	270	5.95	243	4.95	83	5.3	130	6.3	305	4.05	15
26	5.75	208	5.9	235	4.5	41	5.1	102	6.75	395	4.0	13
27	5.50	165	5.4	150	4.65	53	5.0	90	6.65	375	4.0	13
28	5.25	123	5.3	130	5.3	130	4.9	77	6.0	250	3.9	9
29	5.0	90	....	....	5.1	102	4.95	83	5.85	225	3.9	9
30	4.95	83	....	....	5.6	180	4.9	77	5.5	165	3.9	9
31	4.75	62	....	....	5.4	150	....	....	5.3	130	....	....

	July.		August.		September.		October.		November.		December.	
1	3.90	9	3.80	6	3.30	0.5	5.50	165	7.45	562	5.75	202
2	3.80	6	3.80	6	3.65	3.2	5.40	150	6.95	437	5.4	150
3	3.70	3	3.80	6	3.90	9.0	5.00	90	6.50	345	5.4	150
4	3.70	3	3.75	5	3.85	7.5	4.95	85	6.00	250	6.2	290
5	3.60	2	3.70	4	3.55	2.0	4.45	37	5.90	230	7.45	565
6	3.60	2	3.70	4	3.40	1.0	4.30	27	5.90	230	8.45	810
7	3.70	3	3.70	4	3.30	0.5	4.00	13	5.90	230	8.30	750
8	3.80	6	3.70	4	3.30	0.5	4.00	13	5.90	230	7.30	525
9	4.00	13	3.70	4	3.45	1.2	4.00	13	5.50	165	7.00	450
10	4.30	27	3.60	2.5	3.50	1.5	4.00	13	5.40	150	6.25	302
11	4.50	41	3.50	1.5	3.40	1.0	3.90	9	5.50	165	6.0	250
12	4.40	33	3.50	1.5	3.40	1.0	3.90	9	5.90	230	5.9	230
13	4.30	27	3.40	1.0	3.30	0.5	3.90	9	5.75	202	5.9	230
14	4.30	27	3.40	1.0	3.30	0.5	3.90	9	5.30	135	5.75	202
15	4.05	15	3.40	1.0	3.30	0.5	3.90	9	5.30	135	6.30	305
16	4.15	20	3.40	1.0	3.30	0.5	3.90	9	5.30	135	6.75	395
17	4.20	22	3.40	1.0	3.30	0.5	4.15	20	5.40	150	6.90	429
18	3.95	11	3.40	1.0	3.30	0.5	5.05	97	5.85	220	5.90	230
19	3.90	9	3.40	1.0	3.30	0.5	6.45	335	5.6	180	5.60	180
20	4.00	13	3.40	1.0	3.30	0.5	7.50	575	5.5	165	5.60	180
21	4.00	13	3.30	0.5	3.40	1.0	7.30	525	5.75	202	5.95	437
22	4.00	13	3.30	0.5	3.40	1.0	7.00	450	5.90	230	5.90	425
23	4.00	13	3.30	0.5	3.35	0.7	6.00	250	5.65	188	5.40	150
24	4.00	13	3.30	0.5	3.30	0.5	6.25	297	5.40	150	5.40	150
25	3.90	9	3.30	0.5	3.30	0.5	7.00	450	5.20	120	5.40	150
26	3.90	9	3.30	0.5	3.30	0.5	7.80	650	5.40	150	5.20	120
27	3.90	9	3.35	0.7	3.30	0.5	8.25	765	6.20	290	5.00	90
28	3.85	7	3.4	1.0	3.20	0	7.15	487	6.10	270	4.90	80
29	3.80	6	3.20	0	3.20	0	6.30	305	6.00	250	4.60	50
30	3.80	6	3.20	0	3.20	0	6.90	425	6.00	250	4.60	50
31	3.90	9	3.20	0	......	......	7.50	575	......	......	4.60	50

Monthly Discharge of Lynn Creek below City Intake for 1915.

(Drainage area, 14 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	270	13	115.0	8.21	9.46	7,070
February	243	57	169.0	12.07	12.57	9,390
March	305	41	151.0	10.78	12.43	9,280
April	1,200	77	193.0	13.78	15.38	11,480
May	395	49	203.0	14.50	16.72	12,480
June	165	9	56.0	4.00	4.46	3,330
July	41	2	12.9	0.92	1.06	793
August	6	0	2.0	0.14	0.16	123
September	9	0	1.2	0.09	0.10	71
October	765	9	221.0	15.80	18.22	13,600
November	562	120	222.0	15.90	17.70	13,200
December	810	50	277.0	19.80	22.80	17,000
The year	1,200	0	135.3	9.67	131.06	97,817

MESLILOET RIVER.—(1011).

Location.—A short distance below canyon, 8 miles above mouth of river and in section 8, township 7, range 7, west of the 7th meridian.

Records Available.—Daily discharges from October, 1912, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Estimated at 65 square miles.

Gauge.—Vertical staff bolted to rock. Gauge readings taken twice a week by Mr. J. L. Davis.

Channel.—Boulders and gravel, permanent control.

Discharge Measurements.—Fifteen discharge measurements taken during 1912-13-14-15, give a well defined rating curve.

Winter Flow.—Open water conditions all winter.

Accuracy.—"C," because of infrequent gauge readings (twice a week).

Co-operation.—Gauge readings are maintained by the Westminster Power Company.

Discharge Measurements of Mesliloet River 8 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 6	C. E. Dobbie	1,057	75	205	2.30	2.85	476
July 16	R. V. Gordon	1,505	85	157	1.31	2.15	205
July 17	R. V. Gordon	1,505	84	159	1.19	2.05	174

Daily Gauge Height and Discharge of Mesliloet River 8 Miles above Mouth for 1915.

(Drainage area, 65 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	4.2	1,290	....	245	2.15	185	....	1,560	....	240	....	300
2	....	860	2.5	280	....	188	....	2,120	2.4	250	2.6	310
3	2.9	435	....	250	....	191	....	2,680	....	300	....	330
4	....	426	....	220	2.2	195	....	1,880	....	350	....	350
5	....	417	2.2	195	....	203	3.9	1 080	2.85	410	....	370
6	....	408	....	240	....	210	....	965	2.80	390	2.8	390
7	....	399	2.5	280	2.3	220	....	850	....	380	....	340
8	2.8	390	....	260	....	210	....	735	....	370	....	295
9	....	420	....	240	....	195	....	620	....	365	2.4	250
10	....	450	....	220	....	185	....	505	....	360	....	245
11	3.0	485	....	200	....	170	2.8	390	....	350	....	245
12	....	400	2.15	185	2.05	160	....	420	....	340	....	240
13	....	315	....	160	....	660	....	450	....	330	2.35	235
14	....	230	1.95	135	....	1,160	3.0	485	....	325	....	230
15	2.0	145	....	142	4.7	1,650	....	485	....	320	....	225
16	....	130	....	149	....	1,260	....	485	2.6	310	2.3	220
17	....	114	....	156	....	870	....	485	....	260	....	220
18	1.75	98	....	163	3.0	485	3.0	485	....	210	....	220
19	....	100	2.1	170	....	495	....	450	....	165	....	220
20	....	102	....	150	....	505	....	420	1.85	115	....	220
21	....	103	1.9	125	....	515	2.8	390	....	180	2.3	220
22	1.8	105	....	190	....	530	....	355	....	245	....	220
23	....	98	....	255	3.1	540	....	320	2.6	310	....	220
24	1.7	90	....	320	....	430	....	285	....	370	2.3	220
25	....	83	2.8	390	....	320	2.4	250	....	425	....	200
26	....	76	....	360	2.3	220	....	240	3.0	485	....	180
27	1.6	70	....	330	....	205	....	230	....	430	2.05	160
28	....	105	....	300	2.2	195	2.3	220	....	380	....	160
29	....	140	....	....	....	315	....	230	....	330	....	160
30	....	175	....	....	2.9	435	....	235	2.5	280	....	160
31	....	210	....	....	....	1000	....	....	....	290	....	....

	July.		August.		September.		October.		November.		December.	
1	2.20	195	....	113	2.30	220	....	95	4.5	1,510	....	860
2	....	195	1.84	113	....	190	....	95	....	1,165	4.0	1,150
3	....	195	....	113	....	150	....	100	....	825	....	1,030
4	2.20	195	....	113	....	110	....	100	3.0	485	....	910
5	....	198	....	113	1.60	70	1.80	105	....	445	3.5	790
6	....	201	1.84	113	....	73	....	90	....	400	....	1,365
7	....	204	....	102	....	76	....	70	....	355	....	1,940
8	2.25	207	....	92	....	79	1.40	50	2.60	310	5.8	2,520
9	....	204	1.66	82	....	82	....	85	....	225	....	2,010
10	....	200	....	86	....	86	....	120	....	200	....	1,500
11	....	198	....	90	1.70	90	2.05	158	2.00	145	....	990
12	2.20	195	....	94	....	70	....	153	....	145	3.0	485
13	....	192	....	98	1.40	50	....	148	....	145	....	410
14	....	188	1.78	102	....	50	....	143	....	145	....	330
15	....	185	....	99	....	52	....	138	2.00	145	2.4	250
16	2.15	182	1.74	96	1.42	52	1.94	133	....	225	....	320
17	2.05	158	....	92	....	55	....	151	....	310	....	390
18	....	153	....	86	....	58	2.10	170	2.80	390	....	460
19	....	148	....	82	1.50	60	....	1,010	....	460	3.1	540
20	....	143	....	78	....	60	....	1,850	....	525	....	630
21	....	139	1.62	74	....	60	6.0	2,680	....	595	....	710
22	....	135	....	54	1.50	60	....	2,420	3.30	660	3.5	790
23	....	131	1.25	35	....	57	....	2,160	....	485	....	660
24	....	127	....	55	....	54	5.0	1,880	2 60	310	....	530
25	1.89	123	....	75	....	50	....	2,280	....	305	....	400
26	....	120	1.74	96	....	46	6.0	2,680	....	300	....	210
27	....	117	....	98	1.32	42	....	2,480	....	290	2.0	145
28	1.85	115	....	100	....	57	....	2,280	....	285	....	140
29	....	115	....	102	....	72	....	2,080	2.5	280	....	135
30	....	114	1.80	105	1.70	90	....	1,880	....	570	....	130
31	....	113	....	162	....	....	....	1,690	....	....	1 9	125

Monthly Discharge of Mesliloet River 8 Miles above Mouth for 1915.

(Drainage area, 65 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,290	70	286	4.40	5.07	17,600
February	390	135	226	3.48	3.62	12,600
March	1,650	160	455	7.00	8.07	28,000
April	2,680	220	677	10.40	11.60	40,300
May	485	115	318	4.89	5.64	19,600
June	390	160	245	3.77	4.21	14,600
July	207	113	164	2.52	2.91	10,100
August	113	35	94	1.45	1.67	5,780
September	220	42	78	1.20	1.34	4,640
October	2,680	50	951	14.63	17.18	58,500
November	1,510	145	422	6.50	7.25	25,100
December	2,520	125	740	11.38	13.95	45,500
The year	2,680	35	388	5.97	82.51	282,320

NICOLUM RIVER.—(1058).

Location.—At the pack trail bridge, 9 miles from Hope and 4 miles from the mouth of the river, in section 27, township 4, range 5, west of 6th meridian.

Records Available.—Daily discharges from August, 1914, to December, 1915. (Records for 1915 are given herein, those preceding are tabulated in a previous report).

Drainage Area.—Thirty square miles, above gauging station.

Gauge.—Vertical staff gauge. Readings irregular. Gauge readers are Mr. W. H. Robinson and Mr. W. N. Thacker.

Channel.—Rocky, water swift at high stages.

Discharge Measurements.—Seven meter measurements taken during 1914-15, giving a well defined rating curve.

Winter Flow.—The gauge height-discharge relation is affected by anchor ice in very cold weather.

Accuracy.—"D." The accuracy is low because of very infrequent gauge readings.

Discharge Measurements of Nicolum River 4 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 8	Cline & Hughes	1,521	25	17.0	1.35	1.05	23
May 27	H. C. Hughes	1,933	36	38.0	2.32	1.70	89
Oct. 30	H. C. Hughes	1,046	41	36.0	2.81	1.65	101

Daily Gauge Height and Discharge of Nicolum River 4 Miles from Mouth for 1915.

(Drainge area, 30 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	35	....	25	....	25	.....	115	....	70	1.65	92
2	....	35	....	25	....	25	2.0	150	....	70	......	85
3	1.2	35	....	25	....	15	....	125	....	70	1.6	85
4	....	35	....	25	....	15	1.7	100	1.5	70	......	85
5	....	35	....	25	1.0	15	....	100	....	70	....	85
6	....	35	....	25	....	15	....	85	....	70	....	85
7	....	35	....	25	....	15	....	85	....	70	....	85
8	....	35	....	25	....	15	....	70	....	70	....	85
9	....	35	1.1	25	....	15	1.5	70	....	85	....	70
10	....	35	....	25	....	15	....	70	....	85	....	70
11	....	25	....	25	1.0	15	....	70	....	85	....	70
12	....	25	....	15	....	15	....	70	1.6	85	....	70
13	....	25	....	15	....	25	....	70	1.6	85	....	70
14	....	25	1.0	15	1.1	25	....	70	....	85	1.5	70
15	....	25	....	15	....	25	....	70	....	100	....	70
16	....	25	1.0	15	....	35	....	85	....	100	....	70
17	....	25	....	15	....	35	....	85	....	116	....	70
18	1.1	25	1.0	15	....	45	....	85	....	133	....	70
19	....	25	......	15	1.3	45	....	85	2.0	150	....	57
20	1.1	25	....	15	....	45	....	85	1.6	85	....	57
21	....	25	....	15	....	35	....	85	....	85	....	57
22	....	25	....	15	....	35	1.6	85	....	100	....	57
23	....	25	....	25	....	35	....	85	1.7	100	1.4	57
24	....	25	....	25	....	25	1.6	85	....	100	....	57
25	....	25	....	25	....	25	....	85	....	100	....	57
26	....	25	1.1	25	1.1	25	1.6	85	....	100	....	57
27	....	25	....	25	....	25	....	85	1.7	100	....	57
28	....	25	1.1	25	....	35	....	85	....	100	....	57
29	....	25	....	....	....	35	....	85	....	100	....	57
30	....	25	....	....	1.3	45	....	70	....	100	1.4	57
31	....	25	....	....	....	80	....	....	1.7	100	....	....

	July.		August.		September.		October.		November.		December.	
1	....	41	....	30	....	20	....	20	1.7	100	....	....
2	....	42	....	30	....	15	....	20	....	85	....	....
3	....	43	....	30	....	15	....	20	1.5	70	....	....
4	....	44	....	25	0.90	15	....	20	1.5	70	....	....
5	1.30	45	....	25	....	15	1.0	20	....	....	....	....
6	....	46	....	25	....	15	1.0	20	....	....	....	....
7	....	47	....	25	0.90	15	....	30	....	....	....	....
8	....	48	1.10	25	....	15	....	80	....	....	....	....
9	....	49	1.10	25	....	15	....	30	....	....	....	....
10	....	50	....	25	....	15	....	40	....	....	....	....
11	....	51	....	25	....	20	....	40	....	....	....	....
12	....	52	....	25	....	20	....	40	....	....	....	....
13	....	53	1.10	25	....	20	....	50	....	....	....	....
14	....	54	....	25	1.0	20	....	50	....	....	....	....
15	....	55	....	25	....	20	....	50	....	....	....	....
16	....	56	....	25	....	20	....	60	....	....	....	....
17	1.40	57	....	25	1.0	20	....	60	....	....	....	....
18	....	51	....	25	....	20	....	60	....	....	....	....
19	1.30	45	....	25	....	20	....	70	....	....	....	....
20	1.30	45	....	25	0.5	20	1.5	70	....	....	....	....
21	....	40	....	25	......	20	1.4	57	....	....	....	....
22	....	40	1.10	25	......	20	....	70	....	....	....	....
23	....	40	....	20	....	20	....	82	....	....	....	....
24	....	40	1.00	20	....	15	....	94	....	....	....	....
25	....	40	1.00	20	....	15	......	106	....	....	....	....
26	....	40	1.00	20	......	15	.....	118	....	....	....	....
27	....	40	....	20	......	15	....	130	....	....	....	....
28	1.20	35	....	20	....	15	....	142	....	....	....	....
29	....	35	....	20	0.9	15	....	155	....	....	....	....
30	....	35	....	20	0.9	15	2.1	168	....	....	....	....
31	1.20	35	1.00	20	....	....	2.0	150	....	....	....	....

Monthly Discharge of Nicolum River 4 Miles above Mouth for 1915.

(Drainage area, 30 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	35	25	28.0	0.93	1.07	1,720
February	25	15	21.0	0.70	0.73	1,170
March	80	15	28.0	0.93	1.07	1,720
April	150	70	86.0	2.87	3.20	5,120
May	150	70	92.0	3.07	3.54	5,660
June	92	57	69.0	2.30	2.57	4,110
July	57	35	45.0	1.50	1.73	2,700
August	30	20	24.0	0.80	0.92	1,480
September	20	15	17.3	0.58	0.65	1,030
October	168	20	66.9	2.23	2.57	4,110
The period	168	15	47.7	1.59	18.08	28,820

NOTE.—Gauge readings too infrequent during November and December to give discharge data.

NORTON CREEK.—(1013).

Location.—At the outlet of Norton lake, in section 10, township 7, range 7, west of the 7th meridian.

Records Available.—Daily discharges from October, 1912, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—The exact drainage area is not known, but it is very small.

Gauge.—Vertical staff. Gauge readings are taken twice a week by Mr. J. L. Davis.

Channel.—Boulders. The control is good.

Discharge Measurements.—Fifteen meter measurements made during 1912-13-14-15, give a well defined rating curve.

Winter Flow.—The lake freezes over, but the stream is free of ice at the gauge, throughout the winter.

Accuracy.—"C," because of infrequent gauge readings.

Co-operation.—The gauge readers are maintained by the Westminster Power Company.

Discharge Measurements of Norton Creek near Norton Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 7	C. E. Dobbie	1 057	2.1	1.4	0.90	2.02	1.2[1]
July 19	R. V. Gordon	1,505	3.0	2.1	0.92	1.99	2.0[1]
Nov. 9	H. C. Hughes	1,046	9.0	11.0	0.41	2.35	4.5[2]

[1] Section at gauge

[2] Section 50 feet above gauge.

Daily Gauge Height and Discharge of Norton Creek at Norton Lake for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	15	....	8	2.65	10	....	10	....	3	....	6
2	....	15	2.60	9	2.60	9	....	11	....	3	....	6
3	....	15	2.55	8	2.55	8	....	12	2.15	2	....	5
4	2.95	20	2.55	8	2.55	8	....	14	....	2	2.40	5
5	2.80	14	2.55	8	....	8	....	15	....	2	....	5
6	2.70	11	....	9	....	8	2.85	16	....	2	....	4
7	2.65	10	....	10	....	8	....	18	2.08	1	2.25	3
8	2.80	14	2.70	11	2.55	8	....	21	....	2	....	3
9	2.75	12	2.75	12	2.55	8	....	23	....	3	....	3
10	....	14	2.80	14	2.55	8	....	26	2.30	4	2.20	3
11	2.85	16	2.75	12	2.55	8	....	29	2.45	6	....	2
12	2.85	16	2.65	10	....	18	....	31	....	6	....	2
13	2.75	12	....	9	....	28	3.25	34	....	6	....	2
14	2.70	11	2.55	8	....	38	....	38	....	6	2.10	2
15	2.60	9	2.50	7	3.55	48	3.45	43	....	6	....	2
16	....	8	2.50	7	3.25	34	....	34	....	6	2.05	2
17	....	6	2.70	11	3.05	24	....	25	2.45	6	....	2
18	....	5	2.70	11	3.05	24	....	16	....	6	....	2
19	2.35	4	....	10	....	22	2.55	8	....	6	....	2
20	2.35	4	....	9	....	21	....	7	2.45	6	....	2
21	2.35	4	....	9	....	9	....	6	....	7	....	1
22	2.35	4	2.50	7	....	18	2.45	6	....	7	2.10	1
23	2.30	4	2.55	8	2.85	16	....	5	....	8	....	1
24	2.30	4	2.55	8	2.85	16	....	4	2.60	9	....	1
25	2.30	4	2.70	11	2.75	12	....	4	....	8	2.05	1
26	2.25	3	....	10	2.65	10	2.25	3	....	8	....	1
27	2.25	3	....	10	....	9	....	3	2.55	8	....	1
28	....	4	....	9	2.55	8	....	3	....	7	2.00	1
29	....	5	....	....	2.55	8	2.25	3	....	7	....	1
30	....	6	....	....	2.55	8	....	3	....	6	....	1
31	....	7	....	....	....	9	....	....	2.45	6	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	....	0.8	....	0.4	....	1.2	1.9	0.7	....	27.0	....	7.6
2	1.90	0.7	....	0.4	2.15	2.3	....	0.7	3.0	22.0	2.6	8.6
3	....	0.6	1.78	0.4	....	2.0	....	0.7	....	26.0	2.8	14.0
4	....	0.5	....	0.4	....	1.4	....	0.7	....	31.0	....	12.5
5	1.80	0.4	1.74	0.3	....	0.8	....	0.7	3.3	36.0	2.7	11.0
6	....	0.5	1.74	0.3	1.70	0.2	1.9	0.7	....	28.0	2.65	9.8
7	....	0.6	....	0.3	....	0.3	....	0.6	....	20.0	....	17.0
8	....	0.7	....	0.3	....	0.4	....	0.6	....	12.0	....	24.0
9	1.90	0.7	....	0.2	....	0.5	1.83	0.5	2.35	4.4	3.2	32.0
10	....	0.9	1.70	0.2	1.83	0.5	....	1.6	2.30	3.7	....	24.0
11	....	1.0	....	0.2	....	0.4	....	2.6	2.25	3.2	....	17.0
12	2.00	1.2	....	0.2	....	0.4	2.3	3.7	....	3.2	2.64	9.6
13	2.05	1.6	....	0.1	....	0.3	....	3.7	....	3.2	2.64	9.6
14	2.00	1.2	1.65	0.1	1.74	0.3	....	3.7	....	3.2	....	8.0
15	....	1.2	....	0.1	....	0.3	2.3	3.7	2.25	3.2	2.50	6.7
16	....	1.2	....	0.1	....	0.3	....	3.7	2.25	3.2	2.50	6.7
17	....	1.2	1.64	0.1	1.74	0.3	....	3.7	2.40	5.2	....	9.0
18	....	1.2	....	0.1	....	0.3	....	3.7	2.60	8.6		11.0
19	1.99	1.2	....	0.1	....	0.2	2.3	3.7	....	8.0	2.80	14.0
20	1.95	1.0	....	0.1	1.68	0.2	....	18.0	....	7.3	2.83	15.2
21	1.92	0.8	1.63	0.1	....	0.2	....	32.0	....	6.6		19.0
22	1.90	0.7	....	0.1	....	0.2	3.50	46.0	....	5.9	3.00	22.0
23	1.89	0.7		0.1	1.67	0.2	....	44.0	2.40	5.2	3.00	22.0
24	....	0.6	1.62	0.1	....	0.2	....	43.0	....	6.9		18.0
25	....	0.5	....	0.1	....	0.2	3.40	41.0	2.60	8.6		14.0
26	1.80	0.4	1.64	0.1	....	0.1	....	48.0	....	8.0		11.0
27	1.85	0.5	....	0.1	....	0.1	3.70	55.0	....	7.3		8.6
28	....	0.5	....	0.1	1.64	0.1	....	50.0	....	6.6	2.5	6.7
29	....	0.5	....	0.1	....	0.1	....	44.0	2.45	5.9		6.7
30	....	0.5	....	0.1	....	0.1	....	38.0	2.50	6.7		6.7
31	....	0.4	1.62	0.1	....	...	....	32.0	....	....	2.5	6.7

Monthly Discharge of Norton Creek at Norton Lake for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	20.0	3.0	9.0	....	....	....
February	14.0	7.0	9.0	....	....	....
March	48.0	8.0	15.0	....	....	....
April	43.0	3.0	16.0	....	....	....
May	9.0	1.0	5.0	....	....	....
June	6.0	1.0	2.0	....	....	....
July	1.6	0.4	0.8	....	....	....
August	0.4	0.1	0.2	....	....	....
September	2.3	0.1	0.5	....	....	....
October	55.0	0.5	17.1	....	....	....
November	36.0	3.2	10.9	....	....	....
December	32.0	6.7	13.2	....	....	....
The year	55.0	0.1	8.2	....	....	....

SEYMOUR CREEK.—(1022).

Location.—Above the Vancouver waterworks intake, about 7 miles from the mouth.

Records Available.—Daily discharges from November, 1913, to December, 1915. Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Above the intake, 69 square miles, estimated by the Provincial Water Rights Branch.

Gauge.—Vertical staff gauge spiked to the cribbing at the intake. Gauge readings are taken daily by Mr. G. Skinner.

Channel.—Rocks and boulders; water swift at high stages.

Discharge Measurements.—Ten meter measurements made during 1913-14-15, give a well defined rating curve.

Winter Flow.—Open water all winter.

Accuracy.—"B."

Co-operation.—Gauge readings are made by the employees of the Vancouver Waterworks Department.

Discharge Measurements of Seymour River above Seymour Intake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 14	C. G. Cline	1,521	185	364	1.90	2.23	710.0
June 10	C. G. Cline	1,505	135	247	1.00	1.37	248.0
Aug. 12	C. G. Cline	1,057	55	94	0.40	0.22	41.9[1]

[1] Not at regular section.

Daily Gauge Height and Discharge of Seymour Creek above City Intake for 1915

(Drainage area, 69 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.45	950	2.05	575	1.8	390	4.55	5,375	1.4	210	1.85	425
2	2.55	1,050	1.90	460	1.6	290	5.35	7,750	1.4	210	1.7	340
3	2.75	1,325	1.60	290	1.7	340	3.3	2,350	1.85	425	1.6	290
4	2.15	665	1.50	250	1.8	390	2.7	1,250	2.0	530	1.7	340
5	1.65	315	1.40	210	2.05	575	2.4	900	2.0	530	1.8	390
6	1.55	270	2.00	530	1.9	460	2.3	800	2.05	575	1.8	390
7	1.97	495	2.05	575	1.8	390	2.95	1,650	2.15	665	1.75	365
8	2.35	850	2.05	575	1.7	340	2.8	1,400	2.0	530	1.55	270
9	2.02	550	2.00	530	1.5	250	2.3	800	1.95	495	1.45	230
10	1.95	495	1.75	365	1.55	270	2.1	620	2.52	1,020	1.4	210
11	2.75	1,325	1.60	290	1.5	250	2.6	1,100	2.40	900	1.45	230
12	2.17	685	1.50	250	1.4	210	2.7	1,250	2.20	710	1.5	250
13	1.90	460	1.50	250	1.4	210	2.6	1,100	2.00	530	1.4	210
14	1.80	390	1.40	210	3.5	2,800	2.3	800	1.95	495	1.3	180
15	1.65	315	1.35	195	3.55	2,900	2.15	665	2.00	530	1.3	180
16	1.50	250	1.60	290	2.6	1,100	2.3	800	1.80	390	1.3	180
17	1.35	195	2.60	1,100	2.2	710	2.4	900	1.75	365	1.25	165
18	1.30	180	2.00	530	2.55	1,050	2.3	800	1.90	460	1.25	165
19	1.30	180	1.67	325	2.2	710	2.4	900	2.00	530	1.20	150
20	1.30	180	1.52	260	2.05	575	2.25	755	1.95	495	1.25	165
21	1.25	165	1.45	230	2.5	1,000	1.9	460	1.85	425	1.25	165
22	1.20	150	1.60	290	2.6	1,100	1.75	365	1.80	390	1.2	150
23	1.20	150	1.90	460	2.5	1,000	1.8	390	1.75	365	1.2	150
24	1.15	140	2.20	710	2.25	755	1.85	425	1.70	340	1.2	150
25	1.10	130	2.30	800	2.0	530	1.7	340	2.27	775	1.1	130
26	1.05	120	1.90	460	1.75	365	1.75	365	2.3	800	1.0	110
27	1.00	110	1.70	340	1.6	290	1.65	315	2.5	1,000	1.0	110
28	1.00	110	1.95	495	1.6	290	1.60	290	2.3	800	0.95	100
29	1.00	110	....	....	1.82	405	1.70	340	2.0	530	1.0	110
30	1.00	110	....	....	2.5	1,000	1.55	270	1.8	390	1.0	110
31	1.67	325	....	....	2.2	710	....	....	1.7	340	....	....

	July.		August.		September.		October.		November.		December.	
1	1.00	110	0.50	55	0.60	60	0.51	55	3.2	2,150	1.60	290
2	1.00	110	0.45	52	0.90	95	1.80	390	2.1	620	2.03	560
3	0.95	102	0.40	50	0.70	70	1.75	365	1.55	270	3.08	1,910
4	0.90	95	0.40	50	0.70	70	1.60	290	1.40	210	3.30	2,350
5	0.85	88	0.40	50	0.60	60	1.55	270	2.10	620	2.70	1,250
6	0.85	88	0.35	48	0.60	60	1.50	250	1.80	390	2.80	1,400
7	0.80	80	0.30	45	0.55	57	1.45	230	1.70	340	2.35	850
8	0.95	102	0.30	45	0.65	65	1.40	210	1.50	250	4.90	6,400
9	1.05	120	0.30	45	0.80	80	1.35	195	1.40	210	2.80	1,400
10	0.90	95	0.35	48	0.75	75	1.35	195	1.30	180	2.25	755
11	0.90	95	0.38	49	0.70	70	1.40	210	1.25	165	2.05	575
12	0.90	95	0.50	55	0.65	65	1.80	390	1.20	150	2.10	620
13	1.05	120	0.50	55	0.60	60	2.35	850	1.10	130	2.05	575
14	0.90	95	0.40	50	0.60	60	2.2	710	1.10	130	1.9	460
15	0.90	95	0.40	50	0.55	57	1.8	390	1.30	180	1.7	340
16	1.20	150	0.40	50	0.55	57	1.6	290	1.50	250	1.6	290
17	1.10	130	0.35	48	0.45	52	1.45	230	2.10	620	1.45	230
18	1.00	110	0.30	45	0.40	50	1.97	510	2.00	530	1.40	210
19	0.85	88	0.50	45	0.40	50	2.00	530	1.80	390	1.47	240
20	0.80	80	0.30	45	0.30	45	3.00	1,750	1.60	290	2.75	1,325
21	0.70	70	0.25	42	0.30	45	3.70	3,250	1.65	315	2.80	1,400
22	0.70	70	0.25	42	0.30	45	3.00	1,750	1.90	460	2.50	1,000
23	0.65	65	0.27	44	0.25	42	2.25	755	2.50	1,000	2.20	710
24	0.60	60	0.30	45	0.25	42	2.35	850	2.10	620	1.85	125
25	0.60	60	0.30	45	0.25	42	2.90	1,550	2.25	755	1.70	340
26	0.60	60	0.30	45	0.25	42	3.70	3,250	2.60	1,100	1.50	250
27	0.60	60	0.30	45	0.25	42	4.50	5,250	2.00	530	1.40	210
28	0.60	60	0.30	45	0.22	41	5.90	8,150	1.70	340	1.40	210
29	0.60	60	0.30	45	0.22	41	3.00	1,750	2.00	530	1.30	180
30	0.55	57	0.40	50	0.22	41	2.90	1,550	1.95	495	1.20	150
31	0.50	55	0.60	60	.....	.....	4.90	6,400	.....	.....	1.20	150

NOTE.—Gauge heights corrected for raising of dam, August 24, 25 and August 31 to September 21.

Monthly Discharge of Seymour Creek above City Intake for 1915.

(Drainage area, 69 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,325	110	411	5.96	6.87	25,300
February	1,100	195	423	6.13	6.38	23,500
March	2,900	210	700	10.13	11.67	43,000
April	7,750	270	1,184	17.17	19.16	70,400
May	1,020	210	540	7.82	9.02	33,200
June	425	100	214	3.10	3.46	12,700
July	150	55	88	1.27	1.46	5,410
August	60	42	48	0.70	0.81	2,950
September	95	41	56	0.81	0.90	3,330
October	8,150	55	1,380	20.00	23.10	84,800
November	2,150	130	474	6.87	7.67	28,200
December	6,400	150	872	12.60	14.50	53,600
The year	8,150	41	533	7.71	105.00	386,390

SILVER-PITT CREEK.—(1017).

Location.—At lower end of canyon, about 2 miles from mouth of creek, in section 8, township 4, range 5, west of the 7th meridian.

Records Available.—Daily discharges from August, 1912, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports).

Drainage Area.—Seventy square miles, above gauging station.

Gauge.—Vertical staff gauge. Gauge readings are taken three times per week by Mr. J. L. Klein.

Channel.—Rocky bottom; permanent control.

Discharge Measurements.—Nine meter measurements made during 1912-13-14-15, give a well defined rating curve.

Winter Flow.—Open water all year.

Accuracy.—"C." Gauge readings only three times a week.

Co-operation.—None.

Discharge Measurements of Silver-Pitt Creek 2 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 19	H. C. Hughes	1,046	31	45	1.28	0.62	57.6

Daily Gauge Height and Discharge of Silver Pitt Creek, 2 Miles from Mouth for 1915.

(Drainage area, 70 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.85	297	1.4	195	0.80	84	....	668	....	175	....	175
2	....	278	....	220	....	92	3.25	742	1.4	195	1.2	155
3	....	259	1.65	250	0.90	100	....	538	....	210	....	131
4	1.60	240	....	355	....	147	2.0	335	....	225	0.95	108
5	....	210	2.4	460	1.4	195	....	318	1.6	240	....	100
6	1.35	185	....	390	....	188	....	301	....	221	....	92
7	....	260	....	320	....	181	1.8	285	1.45	207	0.8	84
8	2.00	335	1.6	240	1.3	175	....	297	....	194	0.95	108
9	....	445	....	220	....	145	1.9	310	1.35	185	....	108
10	....	555	1.4	195	1.0	115	....	297	....	222	....	108
11	3.00	660	....	210	....	104	1.8	285	....	259	0.95	108
12	....	500	1.5	220	0.85	92	....	325	1.85	297	....	114
13	2.00	335	....	198	....	320	....	365	....	380	....	120
14	....	290	....	176	2.65	547	2.25	412	2.4	460	1.05	125
15	1.60	240	1.2	155	....	476	....	368	....	423	....	125
16	....	225	....	132	....	405	2.0	335	....	386	1.05	125
17	....	210	0.95	108	2.0	335	....	310	2.05	347	....	140
18	1.40	195	0.80	84	....	287	1.8	285	....	371	1.20	155
19	....	180	....	92	1.6	240	....	273	2.2	395	....	142
20	1.25	165	....	100	....	230	....	261	....	301	....	129
21	....	120	....	108	1.5	220	1.65	250	1.45	207	1.0	115
22	0.70	70	1.0	115	....	227	....	223	....	239	....	111
23	....	65	....	150	....	234	1.4	195	1.75	272	0.95	108
24	....	60	1.35	185	1.6	240	....	188	....	325	....	90
25	0.60	57	....	150	....	224	....	181	....	377	0.70	70
26	....	54	1.0	115	1.45	207	1.3	175	2.3	430	....	67
27	0.55	51	....	105	....	181	....	170	....	370	0.65	64
28	0.4	35	....	95	1.2	155	1.25	165	1.9	310	....	62
29	....	75	....	....	....	205	....	160	....	271	....	60
30	....	115	....	....	....	350	1.2	155	....	233	0.60	57
31	....	155	....	....	2.8	595	....	....	1.4	195	....	....

	July.		August.		September.		October.		November.		December.	
1	....	45	....	40	1.40	195	0.40	35	....	740	1.95	320
2	0.50	45	0.45	40	....	135	....	95	....	600	....	375
3	....	45	....	40	0.75	77	1.20	155	2.4	460	2.30	430
4	0.50	45	0.45	40	....	65	....	125	....	390	....	380
5	....	45	....	35	....	55	....	105	1.95	320	....	330
6	....	45	0.40	35	0.50	45	0.80	84	....	300	1.8	285
7	0.50	45	....	35	....	75	....	100	....	280	....	720
8	....	48	....	35	0.90	100	1.00	115	1.7	260	4.6	1,160
9	0.55	51	0.40	35	....	120	....	255	....	285	....	850
10	0.90	100	....	35	1.10	135	2.20	395	1.9	310	2.6	530
11	0.70	70	0.40	35	....	100	....	360	....	280	....	465
12	....	85	....	30	....	70	....	320	1.65	250	....	400
13	....	100	0.35	30	0.45	40	1.80	285	....	215	2.0	335
14	1.00	115	....	30	....	40	....	200	....	180	....	365
15	....	160	....	30	0.40	35	1.00	115	1.15	145	2.20	395
16	1.45	207	0.30	25	....	35	....	100	....	215	....	395
17	....	130	....	25	0.40	35	0.80	84	1.80	285	2.2	395
18	0.60	57	0.30	25	....	35	....	270	....	410	....	495
19	....	55	....	25	0.40	35	....	455	2.65	540	2.8	595
20	....	55	0.30	25	....	35	2.95	645	....	440	....	640
21	0.55	51	....	25	....	30	....	590	2.0	335	....	690
22	....	51	....	25	0.35	30	2.60	350	....	300	3.25	740
23	0.55	51	0.30	25	....	30	....	560	....	270	....	540
24	....	50	....	25	0.35	30	2.80	595	1.6	240	2.00	335
25	....	45	0.30	25	....	30	....	780	....	190	....	300
26	0.50	45	....	25	0.30	25	....	970	1.15	145	....	260
27	....	40	0.30	25	....	25	4.60	1,160	....	175	1.50	220
28	0.45	40	....	25	....	25	....	1,090	....	205	....	200
29	....	40	....	25	0.30	25	4.15	1,025	1.60	240	1.30	175
30	0.45	40	0.30	25	....	25	....	950	....	280	....	120
31	....	40	....	110	....	....	3.7	880	....	....	0.70	70

Monthly Discharge of Silver Pitt Creek 2 Miles from Mouth for 1915.

(Drainage area, 70 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage area.	Total in acre-feet.
January	660	35	223	3.19	3.68	13,700
February	460	95	191	2.73	2.84	10,600
March	547	84	235	3.36	3.87	14,400
April	742	155	306	4.37	4.88	18,200
May	460	175	288	4.11	4.74	17,700
June	175	157	108	1.54	1.72	6,430
July	207	40	66	0.94	1.08	4,060
August	110	25	33	0.47	0.54	2,030
September	195	25	58	0.83	0.93	3,450
October	1,160	35	433	6.20	7.15	26,600
November	740	145	310	4.43	4.94	18,400
December	1,160	70	436	6.23	7.18	26,800
The year	1,160	25	224	3.20	43.55	162,370

SKAGIT RIVER.—(1055).

Location.—40 Miles from Hope and 4 miles from International boundary.

Records Available.—Daily discharges from March, 1915, to December, 1915.

Drainage Area.—Three hundred and fifty-six square miles, above the measuring section. Taken from the provincial government map of 1913.

Gauge.—Gurley automatic gauge.

Channel.—Fine gravel, good control, open current.

Discharge Measurements.—Five discharge measurements made during 1914-15, give a well defined rating curve.

Winter Flow.—The stream is affected by ice during the winter months.

Accuracy.—"C." Gauge was out of order for a short period.

SKAGIT RIVER.—(1055).

The Skagit river rises in the mountains about 30 miles south-east of Hope and discharges into the Gulf of Georgia. Some of the mountains in its watershed rise to an elevation of 6,000 feet. It crosses the International boundary about 44 miles south-east of Hope. About 360 square miles of its drainage basin are in Canada.

The precipitation in the Skagit river basin is probably about 90 inches per annum. In the winter the snowfall is fairly heavy. The stream freezes over in many places and is usually affected by ice during January and February.

The Boundary pack trail follows the Skagit river from the Hope-Princeton trail to the boundary, a distance of about 20 miles. When the Pacific highway is completed it will greatly facilitate transportation in this part of the country.

There is very little development or settlement in the Skagit river valley, in Canada. There are some mining prospects but little more than assessment work has been done as yet. The valley near the boundary has some possibilities as a stock raising country.

There is a proposal to divert water from the Sumallo river, a tributary of the Skagit, into the lakes which feed the Nicolum river. This would augment the flow of the Nicolum sufficiently to make a power development practicable. It is possible to obtain a head of 2,000 feet.

In connection with the above-mentioned plan of development, this survey has established four gauging stations, located as follows; the Skagit river, four miles from the boundary, the Sumallo river, one mile from its mouth, the Sumallo river, eight miles from its mouth, and the Nicolum river, five miles from its mouth. A Gurley automatic gauge was installed on the Skagit river, four miles from the boundary, in March, 1915.

Discharge Measurements of Skagit River 4 Miles above International Boundary for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 14	Cline & Hughes	1,521	140	228	0.80	8.92	193
Mar. 26	H. C. Hughes	1,521	143	379	1.68	9.80	635
May 30	H. C. Hughes	1,933	144	454	2.40	10.48	1,099
Oct. 26	H. C. Hughes	1,046	142	370	1.93	9.99	714
Oct. 28	H. C. Hughes	1,046	145	480	2.60	10.65	1,250

Daily Gauge Height and Discharge of Skagit River 4 Miles from International Boundary for 1915.

(Drainage area, 356 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	10.20	890	10.10	820	10.44	1,000
2	......	......	......	......	......	......	10.50	1,100	10.00	760	10.39	1,025
3	......	......	......	......	......	......	10.60	1,170	10.00	760	10.34	990
4	......	......	......	......	......	......	10.70	1,240	10.00	760	10.33	980
5	......	......	......	......	......	......	10.50	1,100	10.00	760	10.41	1,035
6	......	......	......	......	......	......	10.40	1,030	10.20	890	10.52	1,115
7	......	......	......	......	......	......	10.30	960	10.30	960	10.55	1,135
8	......	......	......	......	......	......	10.25	925	10.45	1,065	10.45	1,065
9	......	......	......	......	......	......	10.15	855	10.45	1,065	10.33	980
10	......	......	......	......	......	......	10.10	820	10.40	1,030	10.25	925
11	......	......	......	......	......	......	10.10	820	10.30	960	10.25	925
12	......	......	......	......	......	......	10.15	855	10.25	925	10.18	875
13	......	......	......	......	......	......	10.30	960	10.20	890	10.13	840
14	......	......	......	......	......	......	10.25	925	10.20	890	10.11	825
15	......	......	......	......	......	......	10.25	925	10.20	890	10.12	835
16	......	......	......	......	......	......	10.30	960	10.20	890	10.13	840
17	......	......	......	......	......	......	10.40	1,030	10.10	820	10.18	875
18	......	......	......	......	......	......	10.50	1,100	10.20	890	10.16	860
19	......	......	......	......	......	......	10.55	1,135	10.30	960	10.05	790
20	......	......	......	......	......	......	10.60	1,170	10.40	1,030	10.00	760
21	......	......	......	......	......	......	10.55	1,135	10.40	1,030	9.94	725
22	......	......	......	......	......	......	10.30	960	10.40	1,030	9.92	710
23	......	......	......	......	......	......	10.30	960	10.25	925	9.93	720
24	......	......	......	......	......	......	10.25	925	10.25	925	9.95	730
25	......	......	......	......	......	......	10.20	890	10.25	925	9.89	695
26	......	......	......	......	......	......	10.20	890	10.20	890	9.84	665
27	......	......	......	......	9.71	585	10.20	890	10.25	925	9.81	645
28	......	......	......	......	9.71	585	10.20	890	10.30	960	9.76	615
29	......	......	......	......	9.72	590	10.20	890	10.20	890	9.76	615
30	......	......	......	......	9.74	605	10.10	820	10.48	1,085	9.78	630
31	......	......	......	......	9.75	610	......	......	10.41	1,035	......	......

	July.		August.		September.		October.		November.		December.	
1	9.81	645	9.52	470	9.04	235	8.50	50	10.66	1,210	9.24	330
2	9.82	650	9.50	460	9.05	240	8.70	110	10.44	1,060	9.22	320
3	9.84	665	9.45	435	9.05	240	8.90	180	10.30	960	9.21	315
4	9.85	670	9.38	400	9.05	240	8.90	180	10.23	910	9.25	335
5	9.82	650	9.35	385	9.05	240	8.90	180	10.27	940	9.28	350
6	9.77	620	9.34	380	9.05	240	8.90	180	10.17	870	9.28	350
7	9.73	600	9.32	370	9.05	240	8.90	180	10.07	800	9.28	350
8	9.67	560	9.28	350	9.05	240	8.90	180	9.99	755	9.55	490
9	9.63	540	9.27	345	8.90	180	8.70	110	9.92	710	9.84	665
10	9.58	510	9.26	340	8.90	180	8.70	110	9.84	665	9.73	600
11	9.53	480	9.24	330	8.90	180	8.70	110	9.78	630	9.65	550
12	9.50	460	9.21	315	8.90	180	9.05	240	9.70	580	9.58	510
13	9.47	445	9.20	310	8.90	180	9.05	240	9.63	540	9.53	480
14	9.49	455	9.22	320	8.70	110	9.05	240	9.61	525	9.48	450
15	9.55	490	9.22	320	8.70	110	9.05	240	9.58	510	9.43	425
16	9.59	515	9.22	320	8.70	110	9.05	240	9.55	490	9.40	410
17	9.55	490	9.24	330	8.70	110	9.05	240	9.54	485	9.36	390
18	9.51	465	9.19	305	8.70	110	9.05	240	9.54	485	9.33	375
19	9.48	450	9.19	305	8.70	110	9.20	310	9.51	465	9.31	365
20	9.48	450	9.21	315	8.70	110	9.60	520	9.45	435	9.32	370
21	9.50	460	9.25	335	8.50	50	9.60	520	9.42	420	9.48	450
22	9.50	460	9.26	340	8.50	50	9.60	520	9.42	420	9.68	570
23	9.47	445	9.24	330	8.50	50	9.60	520	9.43	425	9.62	530
24	9.45	435	9.21	315	8.50	50	9.60	520	9.39	405	9.57	500
25	9.44	430	9.18	300	8.50	50	9.80	640	9.38	400	9.54	485
26	9.43	425	9.13	275	8.50	50	10.05	790	9.38	400	9.47	445
27	9.43	425	9.10	260	8.50	50	10.28	945	9.34	380	9.44	430
28	9.45	435	9.09	255	8.50	50	10.70	1,240	9.29	355	9.42	420
29	9.48	450	9.08	250	8.50	50	10.78	1,305	9.29	355	9.32	370
30	9.57	500	9.10	260	8.50	50	10.50	1,100	9.27	345	9.21	315
31	9.57	500	9.03	230	......	......	10.56	1,140	......	......	......	260

Monthly Discharge of Skagit River 4 Miles from International Boundary for 1915.

(Drainage area, 356 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,240	820	974	2.73	3.05	58,000
May	1,065	760	924	2.59	2.99	56,800
June	1,135	615	850	2.38	2.65	50,600
July	670	425	508	1.43	1.65	31,200
August	470	230	331	0.93	1.07	20,400
September	240	50	136	0.38	0.42	8,090
October	1,305	50	430	1.21	1.40	26,400
November	1,210	345	598	1.68	1.87	35,600
December	665	260	426	1.20	1.38	26,200
The period	1,305	50	575	1.61	16.48	313,290

NOTE.—Station established on March 27, 1915.

SOUTH LILLOOET RIVER.—(1018).

Location.—At upper highway bridge, eight miles from mouth, in section 28, township 12, east of the coast meridian.

Records Available.—Daily discharges from October, 1911, to December, 1915.

Drainage Area.—One hundred square miles.

Gauge.—Chain gauge on bridge, also vertical staff gauge on cribbing. Gauge readings are taken daily by Mr. F. Spink.

Channel.—Permanent rocky channel.

Discharge Measurements.—Twelve meter measurements during 1911-12-13-14-15, give a well defined rating curve.

Winter Flow.—Open water all year.

Accuracy.—"B."

Discharge Measurements of South Lillooet River 8 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 15	Cline & Hughes	1,521	125	321	4.70	3.05	1,520
July 5	C. G. Cline	1,505	80	90	2.00	0.80	183

Daily Gauge Height and Discharge of South Lillooet River 8 Miles from Mouth for 1915.

(Drainage area, 100 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.7	480	1.4	320	1.7	480	2.05	740	1.2	230	1.7	480
2	2.3	980	1.7	480	1.7	480	4.3	4,250	1.2	230	1.65	450
3	2.7	1,440	1.7	480	1.65	450	4.6	4,950	1.2	230	1.6	420
4	2.6	1,320	1.8	550	1.7	480	4.1	3,850	1.15	210	1.5	370
5	2.4	1,080	1.85	580	1.7	480	3.4	2,470	1.2	230	1.4	320
6	2.2	880	1.9	620	1.75	510	3.0	1,850	1.2	230	1.4	320
7	2.0	700	1.95	660	1.9	620	2.8	1,570	1.25	250	1.4	320
8	2.4	1,080	2.0	700	1.8	550	2.9	1,710	1.3	270	1.3	270
9	2.4	1,080	2.1	790	1.7	480	2.8	1,570	1.4	320	1.3	270
10	2.3	980	2.2	880	1.75	510	2.6	1,320	1.5	370	1.2	230
11	3.2	2,150	1.9	620	1.7	480	2.4	1,080	1.8	550	1.15	210
12	3.0	1,850	2.0	700	1.7	480	2.4	1,080	2.0	700	1.1	200
13	2.6	1,320	2.0	700	1.6	420	3.3	2,300	2.0	700	1.1	200
14	2.5	1,200	1.8	550	2.4	1,080	3.2	2,150	2.1	790	1.05	180
15	2.3	980	1.7	480	3.4	2,470	3.05	1,920	2.15	840	1.0	170
16	2.2	880	1.6	420	3.2	2,150	2.6	1,320	2.0	700	0.95	160
17	2.0	700	1.9	620	3.0	1,850	2.5	1,200	1.8	550	0.95	160
18	1.7	480	2.1	790	2.9	1,710	2.4	1,080	1.7	180	0.95	160
19	1.7	480	2.0	700	2.7	1,440	2.25	930	1.7	480	1.0	170
20	1.5	370	1.9	620	2.4	1,080	2.0	700	1.8	550	1.0	170
21	1.5	370	1.8	550	2.4	1,080	1.95	660	1.8	550	1.0	170
22	1.45	340	1.7	480	2.5	1,200	1.9	620	1.7	480	0.95	160
23	1.3	270	1.65	450	2.4	1,080	1.7	480	1.6	420	0.95	160
24	1.25	250	1.6	420	2.3	980	1.55	490	1.65	450	0.90	150
25	1.2	230	1.9	620	2.2	880	1.5	370	1.7	480	0.90	150
26	1.15	210	1.8	550	2.0	700	1.45	340	1.8	550	0.90	150
27	1.10	200	1.7	480	1.8	550	1.35	300	1.9	620	0.90	150
28	1.05	190	1.15	510	1.65	450	1.3	270	2.1	790	0.85	145
29	1.00	170	......	....	1.6	420	1.25	250	2.15	830	0.80	140
30	0.95	160	.	....	1.8	550	1.2	230	1.9	620	0.80	140
31	1.10	200	......	.....	1.8	550	....	....	1.8	550	....	....

	July.		August.		September.		October.		November.		December.	
1	0.85	145	0.65	125	0.50	110	0.40	100	3.6	2,820	2.2	880
2	0.85	145	0.65	125	0.45	105	0.50	110	3.1	2,000	2.0	700
3	0.80	140	0.60	120	0.45	105	0.50	110	2.7	1,440	2.2	880
4	0.85	145	0.60	120	0.45	105	0.50	110	2.6	1,320	2.8	1,570
5	0.80	140	0.60	120	0.45	105	0.50	110	2.3	980	2.9	1,710
6	0.75	135	0.55	115	0.45	105	0.50	110	2.2	880	3.2	2,150
7	0.75	135	0.50	110	0.50	110	0.50	110	2.1	790	3.0	1,850
8	0.80	140	0.50	110	0.55	115	0.50	110	2.0	700	4.4	4,500
9	0.75	135	0.50	110	0.55	115	0.50	110	1.8	550	4.2	4,050
10	0.75	135	0.50	110	0.55	115	0.50	110	1.8	550	3.5	2,640
11	0.80	140	0.50	110	0.52	112	0.50	110	1.6	420	3.0	1,850
12	0.80	140	0.50	110	0.50	110	0.70	130	1.5	370	2.8	1,570
13	0.85	145	0.50	110	0.45	105	1.20	230	1.4	320	2.4	1,080
14	0.85	145	0.50	110	0.45	105	1.70	480	1.4	320	2.2	880
15	0.90	150	0.50	110	0.45	105	1.80	550	1.4	320	2.1	790
16	0.90	150	0.45	105	0.45	105	1.80	550	1.6	420	1.9	620
17	0.85	145	0.45	105	0.45	105	1.70	480	1.9	620	1.8	550
18	0.90	150	0.45	105	0.45	105	1.50	370	2.1	790	1.7	480
19	0.90	150	0.45	105	0.45	105	1.50	370	2.0	700	2.0	700
20	0.90	150	0.45	105	0.40	100	1.90	620	2.0	700	2.5	1,200
21	0.90	150	0.50	110	0.40	100	2.60	1,320	2.0	700	2.8	1,570
22	0.85	145	0.50	110	0.40	100	3.00	1,850	1.9	620	3.1	2,000
23	0.80	145	0.45	105	0.40	100	2.80	1,570	2.3	980	2.8	1,570
24	0.75	135	0.45	105	0.40	100	2.80	1,570	2.3	980	2.7	1,440
25	0.75	135	0.40	100	0.40	100	3.00	1,850	2.3	980	2.5	1,200
26	0.70	130	0.40	100	0.40	100	3.00	1,850	2.6	1,320	2.2	880
27	0.75	135	0.40	100	0.40	100	3.50	2,640	2.4	1,080	2.0	700
28	0.70	130	0.40	100	0.40	100	3.50	2,640	2.2	880	2.1	790
29	0.70	130	0.40	100	0.40	100	3.70	3,010	2.3	980	1.9	620
30	0.70	130	0.40	100	0.35	95	3.90	3,400	2.3	980	1.7	480
31	0.65	125	0.45	105	.....	....	3.90	3,400	....	....	1.6	420

Monthly discharge of South Lillooet River 8 Miles from Mouth for 1915.

(Drainage area, 100 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	2,150	160	743	7.43	8.57	45,700
February	880	320	583	5.83	6.07	32,400
March	2,470	420	860	8.60	9.91	52,900
April	4,950	230	1,400	14.00	15.62	83,300
May	840	210	492	4.92	5.67	30,300
June	480	140	225	2.25	2.51	13,400
July	150	125	140	1.40	1.61	8,600
August	125	100	109	1.09	1.26	6,700
September	115	95	105	1.05	1.17	6,250
October	3,400	190	970	9.70	11.20	59,600
November	2,820	320	884	8.84	9.86	52,600
December	4,500	420	1,360	13.60	15.70	83,600
The year	4,950	95	656	6.56	89.15	475,350

SUMALLO RIVER.—(1056).

Location.—One mile from mouth and just south of the railway belt boundary.

Records Available.—Daily discharges from July, 1914, to December, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report).

Drainage Area.—Above the mouth, 70 square miles.

Gauge.—Vertical staff. Gauge readings are taken daily by Mr. W. H. Robinson.

Channel.—Rocky, with good control.

Discharge Measurements.—Twelve meter measurements by the engineers of the British Columbia Hydrometric Survey, and one by L. N. Jensen, in 1914 and 1915. One measurement was under ice conditions.

Winter Flow.—Stream open all winter, but during very cold weather anchor ice affects the relation between gauge height and discharge.

Accuracy.—"B."

Co-operation.—Four meter measurements were made during 1913 and 1914 by L. N. Jensen for MacKenzie & Mann.

Discharge Measurements of Sumallo River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width	Area of Section.	Mean Velocity.	Gauge Height	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec.-ft
Mar. 11	Cline & Hughes	1,521	30	41.0	1.30	0.22	54.3
Mar. 16	Cline & Hughes	1,521	40	62.0	1.90	0.77	118.0
Mar. 29	Hughes	1,521	42	67.0	2.10	1.00	143.0
May 28	Hughes	1,933	48	99.0	3.14	1.80	311.5
May 31	Hughes	1,933	46	88.0	2.80	1.52	247.0
Oct. 29	Hughes	1,046	50	146.0	4.05	2.68	591.0

Daily Gauge Height and Discharge of Sumallo River 1 Mile above Mouth for 1915.

(Drainage area, 70 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.4	70	0.1	45	0.1	45	1.6	265	1.5	245	1.5	245
2	0.4	70	0.1	45	0.1	45	2.1	385	1.4	225	1.5	245
3	0.4	70	0.1	45	0.1	45	2.3	440	1.4	225	1.4	225
4	0.4	70	0.1	45	0.1	45	2.4	465	1.4	225	1.4	225
5	0.4	70	0.1	45	0.1	45	2.1	385	1.4	225	1.6	265
6	0.4	70	0.1	45	0.1	45	1.9	335	1.6	265	1.7	290
7	0.3	60	0.1	45	0.1	45	1.8	310	1.8	310	1.8	310
8	0.3	60	0.1	45	0.1	45	1.7	290	2.0	360	1.6	265
9	0.3	60	0.1	45	0.2	50	1.6	265	2.0	360	1.5	245
10	0.3	60	0.1	45	0.2	50	1.5	245	1.9	335	1.4	225
11	0.3	60	0.1	45	0.2	50	1.5	245	1.8	310	1.4	225
12	0.3	60	0.1	45	0.2	50	1.6	265	1.7	290	1.4	225
13	0.3	60	0.1	45	0.2	50	1.8	310	1.6	265	1.4	225
14	0.3	60	0.1	45	0.3	60	1.7	290	1.6	265	1.4	225
15	0.3	60	0.1	45	0.8	120	1.7	290	1.6	265	1.3	205
16	0.3	60	0.1	45	0.7	105	1.8	310	1.6	265	1.3	205
17	0.3	60	0.1	45	0.7	105	1.9	335	1.5	245	1.3	205
18	0.3	60	0.1	45	0.7	105	2.1	385	1.6	265	1.2	185
19	0.3	60	0.1	45	0.7	105	2.2	410	1.8	310	1.2	185
20	0.2	50	0.1	45	0.7	105	2.3	440	1.9	335	1.2	185
21	0.2	50	0.0	40	0.8	120	2.2	410	1.9	335	1.2	185
22	0.2	50	0.0	40	1.0	150	1.8	310	1.9	335	1.1	165
23	0.2	50	0.0	40	1.3	205	1.8	310	1.7	290	1.2	185
24	0.2	50	0.0	40	1.2	185	1.7	290	1.7	290	1.2	185
25	0.2	50	0.0	40	1.2	185	1.6	265	1.7	290	1.2	185
26	0.2	50	0.0	40	1.1	165	1.6	265	1.6	265	1.1	165
27	0.1	45	0.0	40	1.0	150	1.6	265	1.7	290	1.1	165
28	0.0	40	0.0	40	1.0	150	1.6	265	1.8	310	1.0	150
29	0.1	45	....	....	1.0	150	1.6	265	1.7	290	1.0	150
30	0.1	45	....	....	1.0	150	1.5	245	1.6	265	1.0	150
31	0.1	45	....	....	1.0	150	....	....	1.5	245	....	....

	July.		August.		September.		October.		November.		December.	
1	1.00	150	0.80	120	0.40	70	0.1	45	2.2	420	0.6	92
2	1.00	150	0.80	120	0.40	70	0.2	52	2.0	360	0.6	92
3	1.10	165	0.70	105	0.40	70	0.3	60	1.8	310	0.6	92
4	1.10	165	0.70	105	0.40	70	0.3	60	1.7	290	0.6	92
5	1.10	165	0.70	105	0.40	70	0.3	60	1.7	290	0.6	92
6	1.10	165	0.70	105	0.40	70	0.3	60	1.6	265	0.6	92
7	1.10	165	0.70	105	0.40	70	0.3	60	1.5	245	0.7	105
8	1.10	165	0.60	90	0.40	70	0.3	60	1.5	245	0.8	120
9	1.00	150	0.60	90	0.30	60	0.2	52	1.4	225	1.0	150
10	1.00	150	0.60	90	0.30	60	0.2	52	1.4	225	1.0	150
11	1.00	150	0.60	90	0.30	60	0.2	52	1.3	205	0.9	135
12	1.00	150	0.60	90	0.30	60	0.4	70	1.2	185	0.8	120
13	1.00	150	0.60	90	0.30	60	0.4	70	1.1	165	0.8	120
14	0.90	135	0.50	80	0.20	50	0.4	70	1.0	150	0.7	105
15	0.90	135	0.50	80	0.20	50	0.4	70	1.0	150	0.7	105
16	0.90	135	0.50	80	0.20	50	0.4	70	0.9	135	0.7	105
17	0.90	135	0.50	80	0.20	50	0.4	70	0.9	135	0.7	105
18	0.90	135	0.50	80	0.20	50	0.4	70	0.9	135	0.7	105
19	0.90	135	0.50	80	0.20	50	0.5	80	0.9	135	0.7	105
20	0.80	120	0.50	80	0.20	50	0.9	135	0.8	120	0.8	120
21	0.80	120	0.50	80	0.10	45	0.9	135	0.8	120	0.9	135
22	0.80	120	0.50	80	0.10	45	0.9	135	0.8	120	0.9	135
23	0.80	120	0.50	80	0.10	45	0.9	135	0.8	120	0.9	135
24	0.80	120	0.50	80	0.10	45	0.9	135	0.8	120	0.9	135
25	0.80	120	0.50	80	0.10	45	1.1	165	0.7	105	0.8	120
26	0.80	120	0.50	80	0.10	45	1.3	205	0.7	105	0.8	120
27	0.80	120	0.50	80	0.10	45	1.9	335	0.7	105	0.7	105
28	0.80	120	0.50	80	0.10	45	3.1	850	0.7	105	0.7	105
29	0.80	120	0.50	80	0.10	45	2.6	560	0.7	105	0.7	105
30	0.80	120	0.50	80	0.10	45	2.2	420	0.6	92	0.6	92
31	0.80	120	0.50	80	....	....	2.4	485	....	....	0.6	92

Monthly Discharge of Sumallo River 1 Mile from Mouth for 1915.

(Drainage area, 70 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	70	40	58.0	0.83	0.96	3,570
February	45	40	44.0	0.63	0.66	2,440
March	205	45	100.0	1.43	1.65	6,150
April	485	245	320.0	4.57	5.10	19,000
May	360	225	284.0	4.06	4.68	17,460
June	310	150	210.0	3.00	3.35	12,500
July	165	120	138.0	1.97	2.27	8,480
August	120	80	88.8	1.27	1.46	5.460
September	70	45	55.8	0.80	0.89	3,320
October	485	45	157.0	2.24	2.58	9,650
November	420	92	183.0	2.61	2.91	1,090
December	150	92	112.0	1.60	1.84	6,890
The year	485	40	145.9	2.08	28.35	96,010

SUMALLO RIVER.—(1057).

Location.—Eight miles from mouth, in section 28, township 3, range 24, west of 6th meridian.

Records Available.—Irregular records from July, 1914, to December, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.

Drainage Area.—Seventeen square miles (measured from Dominion map of 1913, scale 3 miles to the inch).

Gauge.—Vertical staff. Gauge readings taken by W. H. Robinson and W. N. Thacker. Gauge readings are very irregular.

Channel.—Gravel.

Discharge Measurements.—Ten meter measurements made during 1914 and 1915 give a well defined rating curve. One measurement was made under ice conditions.

Winter Flow.—Station is somewhat affected by ice during very cold weather.

Accuracy.—"D," because of infrequent gauge readings.

Discharge Measurements of Sumallo River 8 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 15	Cline & Hughes	1,521	36	43.5	1.30	1.05	58.7
Mar. 30	Hughes	1,521	37	50.0	1.64	1.25	82.0
May 29	Hughes	1,933	39	75.0	2.53	1.90	190.0
June 1	Hughes	1,933	39	69.0	2.31	1.72	157.0
Oct. 29	Hughes	1,046	39	90.0	2.96	2.35	266.0

Daily Gauge Height and Discharge of Sumallo River 8 Miles above Mouth for 1915.

(Drainage area, 17 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	38	....	16	....	25	....	150	....	135	1.7	150
2	....	38	....	16	....	24	2.0	200	....	135	....	150
3	0.9	38	....	16	....	24	....	218	....	135	1.7	150
4	....	36	....	16	....	23	2.2	236	1.6	135	....	154
5	....	33	....	16	....	22	....	246	....	145	1.75	158
6	....	30	....	16	....	21	....	192	1.75	158	1.80	166
7	0.8	27	....	16	....	20	....	168	1.90	182	1.85	174
8	....	27	....	16	....	19	....	144	2.00	200	1.75	158
9	....	27	0.7	16	....	18	1.5	120	2.00	200	1.70	150
10	0.8	27	....	14	....	17	....	135	1.95	191	1.65	142
11	....	26	....	13	0.7	16	....	145	1.80	166	....	141
12	....	25	....	12	....	20	1.75	158	1.7	150	....	139
13	....	23	....	11	....	24	1.90	182	1.7	150	....	137
14	....	21	....	9	0.8	27	1.80	166	....	150	1.6	135
15	....	19	0.6	7	....	32	1.80	166	....	150	1.55	127
16	....	17	....	9	....	35	1.90	182	....	150	....	127
17	0.7	16	....	11	....	42	1.90	182	1.7	150	1.55	127
18	....	16	....	13	....	46	2.00	200	1.8	166	....	125
19	....	16	0.7	16	1.0	50	2.10	218	1.9	182	....	124
20	0.7	16	....	17	....	50	2.15	227	1.9	182	....	123
21	....	16	....	19	....	50	2.1	218	....	175	....	122
22	....	16	....	21	....	50	1.8	166	....	170	....	121
23	....	16	....	23	....	50	....	160	1.8	166	1.5	120
24	....	16	....	25	....	50	....	155	....	170	....	120
25	....	16	....	26	....	50	1.7	150	....	175	....	115
26	....	16	0.8	27	....	50	1.7	150	....	180	....	115
27	....	16	....	27	....	50	....	150	1.9	182	....	110
28	....	16	0.8	27	....	50	....	150	....	170	....	110
29	....	16	....	....	....	50	....	150	....	160	....	105
30	....	16	....	....	1.0	50	....	150	....	150	1.4	105
31	....	16	....	....	....	100	....	....	1.7	150	....	....

	July.		August.		September.		October.		November.		December.	
1	....	120	....	85	1.00	50	....	16	2.3	254	1.10	62
2	....	120	....	85	....	46	0.7	16	2.0	200	....	62
3	....	120	....	80	....	42	0.8	27	1.9	182	....	62
4	....	120	....	80	0.90	38	0.8	27	1.8	166	....	62
5	1.50	120	....	75	....	38	0.9	38	....	166	....	62
6	....	115	....	70	0.90	38	0.9	38	....	166	1.10	62
7	....	115	....	65	....	38	0.8	27	1.8	166	1.15	68
8	....	110	1.10	62	....	38	0.8	27	1.7	150	1.25	82
9	....	110	1.10	62	0.90	38	0.7	16	....	142	1.40	105
10	....	105	....	62	....	35	0.7	16	1.6	135	1.40	105
11	....	105	1.10	62	....	35	0.7	16	....	130	1.30	90
12	....	100	1.10	62	....	30	0.9	38	....	120	1.25	82
13	....	100	1.10	62	....	30	....	38	....	110	1.25	82
14	....	95	....	62	0.8	27	0.9	38	2.3	105	1.15	68
15	....	95	....	62	....	27	....	38	1.4	105	....	68
16	....	90	....	62	....	27	0.9	38	1.3	90	....	68
17	1.30	90	....	62	0.8	27	....	38	....	90	....	68
18	....	90	....	62	....	25	0.9	38	....	90	....	68
19	1.30	90	....	62	....	20	1.0	50	1.3	90	1.15	68
20	1.30	90	....	62	....	18	1.40	105	1.25	82	1.25	82
21	....	90	....	62	0.7	16	1.30	90	1.25	82	1.25	82
22	....	90	1.10	62	....	16	1.20	75	....	82	1.30	90
23	....	90	....	62	....	16	1.30	90	....	82	....	90
24	....	90	1.10	62	....	16	1.30	90	1.25	82	1.30	90
25	....	90	1.10	62	....	16	1.45	112	1.15	68	1.25	82
26	....	90	1.10	62	....	16	1.60	135	....	68	1.25	82
27	....	90	....	55	....	16	1.90	182	....	68	1.15	68
28	1.30	90	....	55	....	16	2.50	290	....	68	....	68
29	....	90	....	40	0.7	16	2.30	254	1.15	68	1.15	68
30	....	90	....	40	0.7	16	2.6	308	1.10	62	1.10	62
31	1.30	90	....	40	....	....	2.7	336	....	....	1.10	62

Monthly Discharge of Sumallo River 8 miles from Mouth for 1915.

(Drainage area, 17 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	38	16	22.0	1.30	1.50	1,350
February	27	7	17.0	1.00	1.04	944
March	100	16	37.0	2.18	2.51	2,280
April	246	120	174.0	10.22	11.40	10,400
May	200	135	163.0	9.59	11.06	10,000
June	174	105	133.0	7.82	8.72	7,900
July	120	90	99.7	5.87	6.77	6,130
August	85	40	62.8	3.69	4.25	3,860
September	50	16	27.6	1.62	1.81	1,640
October	336	16	85.4	5.02	5.79	5,250
November	254	62	116.0	6.83	7.62	6,900
December	105	62	74.8	4.40	5.07	4,600
The year	336	7	84.4	4.96	67.54	61,254

YOUNG CREEK.—(1020).

Location.—At mouth, in section 10, township 7, range 7, west of the 7th meridian.

Records Available.—Daily discharges from October, 1912, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in a previous report.)

Drainage Area.—Not determined.

Gauge.—Vertical staff. Gauge readings are taken twice a week by Mr. J. L. Davis.

Channel.—Solid rock.

Discharge Measurements.—Twelve meter measurements made during 1912-13-14-15, give a well defined rating curve.

Winter Flow.—Very heavy snowfall, but little ice, so that open water conditions prevail all winter.

Accuracy.—"C" and "D," because of infrequent gauge readings.

Co-operation.—Gauge readings maintained by the Westminster Power Company.

Discharge Measurements of Young River near Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 8	C. E. Dobbie	1,057	11	12.1	1.30	1.28	16.3
July 19	R. V. Gordon	1,505	11	10.6	0.63	0.93	6.7
July 23	R. V. Gordon	1,505	11	9.7	0.20	0.82	2.6
Nov. 10	H. C. Hughes	1,046	10	10.5	0.68	1.01	7.1

Daily Gauge Height and Discharge of Young Creek at Mouth for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	17	....	15	1.3	17	....	33	....	20	....	15
2	....	17	1.3	17	....	15	....	22	....	20	....	15
3	....	17	....	28	1.2	13	....	31	1.4	22	1.2	13
4	1.3	17	1.65	40	....	13	....	30	....	20	....	13
5	....	17	....	43	....	13	....	29	....	20	....	13
6	....	17	....	46	....	13	1.5	28	....	19	....	13
7	1.3	17	....	49	....	13	....	27	....	18	1.2	13
8	....	19	1.8	53	1.2	13	....	26	1.28	16	....	13
9	....	20	....	41	....	16	....	25	....	16	....	12
10	....	20	....	29	1.35	20	....	24	....	16	1.15	12
11	1.4	22	1.3	17	....	36	....	23	....	16	....	12
12	....	18	....	16	....	52	....	22	....	16	....	11
13	....	14	....	14	....	68	1.37	21	....	17	....	11
14	1.1	10	....	12	....	84	....	106	....	17	1.1	10
15	....	10	1.1	10	2.4	110	3.2	190	....	17	....	9
16	....	10	....	27	....	70	....	175	....	17	1.05	8
17	....	10	1.7	44	1.55	32	....	166	1.3	17	....	8
18	....	10	....	38	....	35	....	145	....	21	....	8
19	1.1	10	....	32	....	38	2.6	130	....	25	....	8
20	....	11	....	26	....	41	....	93	1.5	28	....	8
21	1.15	12	....	20	....	44	....	55	....	29	....	8
22	....	11	1.2	13	....	46	1.3	17	....	31	1.05	8
23	....	9	....	15	1.75	48	....	17	....	33	....	8
24	1.05	8	1.3	17	....	35	....	17	1.6	35	....	7
25	....	8	....	17	1.4	22	....	17	....	38	1.0	7
26	....	7	....	17	....	22	1.3	17	....	41	....	6
27	1.0	7	....	17	....	22	....	17	1.7	44	....	6
28	....	9	....	17	1.4	22	....	17	....	38	0.9	5
29	....	11	....	....	....	28	1.3	17	....	31	....	5
30	....	13	....	....	1.6	35	....	19	....	24	....	5
31	....	13	....	....	....	34	....	....	1.3	17	....	....

	July.		August.		September.		October.		November.		December.	
1	....	4.0	....	3.5	....	6.5	1.05	8.5	....	49.0	....	42.0
2	0.85	4.2	....	3.5	1.10	10.0	....	9.5	1.64	39.0	....	52.0
3	....	4.4	0.76	3.1	....	9.0	....	10.0	....	43.0	1.9	63.0
4	....	4.7	....	3.0	....	7.0	....	11.0	....	47.0	....	54.0
5	0.90	5.0	0.75	3.0	....	5.0	....	12.0	1.78	51.0	....	45.0
6	....	6.0	....	3.0	0.84	4.1	1.20	13.0	....	42.0	1.6	35.0
7	....	7.0	....	3.0	....	4.5	....	10.0	....	33.0	....	67.0
8	....	9.0	....	2.5	....	5.0	....	7.0	....	24.0	....	99.0
9	1.10	10.0	....	2.5	....	6.0	0.80	3.5	....	15.0	2.6	130.0
10	....	12.0	0.7	2.5	1.00	7.0	....	15.0	1.00	7.0	....	101.0
11	....	13.0	....	2.5	....	6.0	....	30.0	....	7.0	....	73.0
12	1.25	15.0	....	2.5	....	5.0	1.70	44.0	....	7.0	....	45.0
13	....	14.0	....	2.5	....	4.0	....	35.0	....	7.0	1.3	17.0
14	....	12.0	....	2.4	0.75	3.0	....	25.0	....	7.0	....	16.0
15	....	10.0	0.68	2.4	....	2.6	1.25	15.0	....	7.0	....	14.0
16	....	10.0	....	8.1	....	2.5	....	18.0	1.00	7.0	1.2	13.0
17	....	8.0	1.22	13.8	0.70	2.5	....	21.0	....	12.0	....	13.0
18	....	6.0	....	13.4	....	2.5	....	24.0	1.30	17.0	....	13.0
19	0.93	5.6	....	13.4	....	2.5	1.50	28.0	....	18.0	....	13.0
20	....	5.0	....	13.4	0.70	2.5	....	46.0	....	19.0	1.2	13.0
21	....	5.0	1.2	13.0	....	2.5	....	64.0	....	20.0	....	33.0
22	....	4.5	....	10.5	....	2.5	2.10	82.0	....	21.0	....	53.0
23	0.83	4.0	....	6.5	0.70	2.5	....	73.0	1.40	22.0	2.0	73.0
24	....	4.0	0.7	2.5	....	2.5	....	63.0	....	33.0	....	59.0
25	....	4.0	....	2.5	....	2.5	1.80	53.0	1.70	44.0	....	46.0
26	0.80	3.5	....	2.4	....	2.4	....	63.0	....	39.0	....	33.0
27	....	3.5	0.67	2.4	....	2.4	....	73.0	....	34.0	....	20.0
28	0.82	3.8	....	2.5	0.68	2.4	2.10	82.0	....	30.0	1.0	7.0
29	....	3.5	....	2.5	....	5.5	....	74.0	....	26.0	....	7.0
30	....	3.5	....	2.5	....	8.5	....	66.0	1.40	22.0	1.0	7.0
31	....	3.5	0.71	2.6	....	....	....	58.0	....	....	....	7.0

Monthly Discharge of Young Creek near Mouth for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	22.0	7.0	13.0	....	....	....
February	53.0	10.0	26.0	....	....	....
March	110.0	13.0	35.0	....	....	....
April	190.0	17.0	52.0	....	....	....
May	44.0	16.0	24.0	....	....	....
June	15.0	5.0	10.0	....	....	....
July	15.0	3.5	6.7	....	....	....
August	13.8	2.4	5.0	....	....	....
September	10.0	2.4	4.4	....	....	....
October	82.0	3.5	37.0	....	....	....
November	51.0	7.0	25.0	....	....	....
December	130.0	17.0	41.0	....	....	....
The year	190.0	2.4	23.3	....	....	....

LILLOOET DISTRICT.

BRANDYWINE RIVER.—(1065).

Location.—Highway Bridge, above Falls; 27 miles from Squamish.

Records Available.—Daily discharges from May 26, 1915, to December 31, 1915.

Drainage Area.—Not determined.

Gauge.—Vertical staff. Gauge readings are taken daily by Mr. G. C. Turpin.

Channel.—Rocky, and covered with boulders. The control is good.

Discharge Measurements.—Six meter measurements, taken during 1915, give a well defined rating curve except for very high stages of the water.

Winter Flow.—The stream is affected by ice during the winter months.

Accuracy.—"B."

BRANDYWINE RIVER.—(1065).

The Brandywine river rises in the mountains, north of Squamish, and discharges into the Cheakamus river about eighteen miles above the mouth.

On the Brandywine watershed the climate is much similar to that of the Cheakamus valley. The total annual precipitation is about ninety inches.

The main line of the Pacific Great Eastern Railway crosses the stream about a mile from its mouth.

Just below the railway trestle the river has a perpendicular fall of about two hundred feet. With a minimum discharge of forty cubic feet a second, about 600 horse-power could be developed very cheaply. This might well be used as a temporary power plant for a larger development on the Cheakamus river.

The surrounding country contains many mineral deposits and, although considerable prospecting is being done at the present time, very few claims have been developed to any extent.

There is a small quantity of timber and a little agricultural land near the mouth of the stream.

Discharge Measurements of Brandywine River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 27	C. G. Cline	1,505	25	81.0	3.20	2.90	256.0
June 10	Hughes & Gordon	1,057	28	75.8	2.40	2.63	182.0
June 11	Hughes & Gordon	1,057	30	101.0	3.60	3.30	364.0
Aug. 16	H. C. Hughes	1,505	30	76.0	2.76	2.68	210.0
Aug. 17	H. C Hughes	1,505	28	58.5	1.95	2.23	114.0
Dec. 9	H. C. Hughes	1,046	26	93.6	0.72	1.90	67.5

Daily Gauge Height and Discharge of Brandywine River above Falls for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	......	......	......	......	2.8	225
2	......	......	......	......	......	......	......	......	......	......	2.8	225
3	......	......	......	......	......	......	......	......	......	......	3.3	370
4	......	......	......	......	......	......	......	......	......	......	3.5	430
5	......	......	......	......	......	......	......	......	......	......	4.0	610
6	......	......	......	......	......	......	......	......	......	......	3.2	340
7	......	......	......	......	......	......	......	......	......	......	3.2	340
8	......	......	......	......	......	......	......	......	......	......	2.8	225
9	......	......	......	......	......	......	......	......	......	......	3.2	340
10	......	......	......	......	......	......	......	......	......	......	2.6	180
11	......	......	......	......	......	......	......	......	......	......	3.3	370
12	......	......	......	......	......	......	......	......	......	......	3.1	310
13	......	......	......	......	......	......	......	......	......	......	3.2	340
14	......	......	......	......	......	......	......	......	......	......	3.4	400
15	......	......	......	......	......	......	......	......	......	......	3.3	370
16	......	......	......	......	......	......	......	......	......	......	3.2	340
17	......	......	......	......	......	......	......	......	......	......	2.9	250
18	......	......	......	......	......	......	......	......	......	......	2.6	180
19	......	......	......	......	......	......	......	......	......	......	2.7	200
20	......	......	......	......	......	......	......	......	......	......	2.7	200
21	......	......	......	......	......	......	......	......	......	......	2.6	180
22	......	......	......	......	......	......	......	......	......	......	2.7	200
23	......	......	......	......	......	......	......	......	......	......	3.3	370
24	......	......	......	......	......	......	......	......	......	......	3.1	310
25	......	......	......	......	......	......	......	......	......	......	2.8	225
26	......	......	......	......	......	......	......	......	2.5	160	2.7	200
27	......	......	......	......	......	......	......	......	2.9	250	2.6	180
28	......	......	......	......	......	......	......	......	2.8	225	3.3	370
29	......	......	......	......	......	......	......	......	2.6	180	2.9	250
30	......	......	......	......	......	......	......	......	2.5	160	3.6	460
31	......	......	......	......	......	......	......	......	2.8	225	......	......

	July.		August.		September.		October.		November.		December.	
1	3.6	460	3.2	340	2.1	95	1.75	47	3.20	340	1.70	45
2	3.7	490	2.5	160	2.2	110	1.80	55	3.05	295	1.82	57
3	3.6	460	2.9	250	2.3	125	1.65	42	2.60	180	2.00	80
4	3.3	370	2.3	125	2.6	180	1.60	40	2.30	125	2.30	125
5	3.4	400	2.5	160	2.1	95	1.45	32	2.20	110	2.45	150
6	2.9	250	2.4	140	1.9	65	1.45	32	2.10	95	2.60	180
7	3.4	400	2.7	200	2.1	95	1.45	32	2.10	95	2.10	95
8	3.5	430	2.2	110	1.9	65	1.45	32	2.00	80	..	80
9	2.7	200	2.7	200	1.8	55	1.42	31	2.00	80	1.90	65
10	2.5	160	2.8	225	1.9	65	1.40	30	1.90	65	1.80	53
11	2.3	125	2.7	200	1.6	40	1.40	30	1.90	65	1.70	45
12	3.3	370	2.8	225	1.8	55	1.50	35	1.90	65	1.70	45
13	2.8	225	2.7	200	1.7	45	1.50	35	1.85	60	1.70	45
14	3.2	340	2.8	225	1.8	55	1.50	35	1.80	55	1.70	45
15	2.7	200	2.7	200	1.9	65	1.50	35	1.90	65	1.65	42
16	2.6	180	2.6	180	2.0	80	1.55	37	2.00	80	1.60	40
17	3.0	280	2.2	110	1.7	45	1.75	47	2.05	87	1.60	40
18	2.6	180	2.7	200	1.7	45	2.15	102	2.10	95	1.60	40
19	2.5	160	2.3	125	2.1	95	2.15	102	2.00	80	1.60	40
20	2.8	225	3.2	340	2.2	110	2.05	87	1.90	65	1.60	40
21	2.3	125	2.7	200	1.6	40	2.25	117	1.80	55	1.65	42
22	2.4	140	3.2	340	1.7	45	2.75	212	1.75	47	1.70	45
23	2.3	125	2.2	110	1.6	40	2.70	200	2.05	87	1.70	45
24	2.8	225	2.6	180	1.65	42	2.70	200	1.95	72	1.65	42
25	2.6	180	2.2	110	1.65	42	2.65	190	1.85	60	1.60	40
26	2.6	180	2.3	125	1.65	42	4.50	810	1.80	55	1.60	40
27	2.7	200	3.0	280	1.6	40	3.65	475	1.70	45	1.60	40
28	2.3	125	2.8	225	1.6	40	5.20	1,120	1.70	45	1.70	45
29	2.7	200	2.7	200	1.6	40	3.30	370	1.80	55	1.90	65
30	2.6	180	2.4	140	1.65	42	2.70	200	1.70	45	1.90	65
31	2.7	200	2.2	110	......	......	3.35	385	......	......	1.90	65

Monthly Discharge of Brandywine River above Falls for 1915.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	610	180	300			
July	490	125	251			
August	340	110	191			
September	180	40	67			
October	1,120	30	168			
November	340	45	92			
December	180	40	61			
The period	1,120	30	160			

NOTE.—Station established May, 1915.

BRIDGE RIVER.—(1045).

Location.—Thirty miles above mouth and ten miles from Mission, on Seton lake.

Records Available.—Daily discharges from October 7th, 1913, to December 31st, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—The Provincial map (scale 17.75 miles to the inch) shows a drainage area of 1,900 square miles above gauging station.

Gauge.—Vertical staff gauge. The gauge reader is Mr. A. Vierra, of Bridge River. Readings are taken twice a day.

Channel.—Wide and deep, with sand and mud bottom, and excellent measuring section.

Discharge Measurements.—Eleven meter measurements taken during 1913-14-15 give a well defined rating curve.

Winter Flow.—The stream is frozen over during the colder winter months.

Accuracy.—"A."

Co-operation.—Gauge readings taken in co-operation with the Bridge River Power Company.

Discharge Measurements of Bridge River 30 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 16	H. C. Hughes	1,057	156	724	0.76	0.95	549[1]
May 7	C. G. Cline	1,505	156	1,090	3.10	3.75	3,410
June 24	Hughes & Gordon	1,057	156	1,794	4.73	7.00	8,482
Aug. 9	H. C. Hughes	1,505	156	1,790	4.73	6.80	8,470

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[1] Measurement taken under ice conditions.

Daily Gauge Height and Discharge of Bridge River 30 Miles above Mouth for 1915.

(Drainage area, 1,900 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.70	1,250	1.30	880	0.80	450	1.40	970	2.85	2,500	4.30	4,400
2	1.60	1,150	1.15	750	0.80	450	1.45	1,020	2.65	2,300	4.35	4,480
3	1.35	920	1.10	700	0.80	450	2.35	1,940	2.75	2,400	4.45	4,620
4	1.25	840	1.10	700	0.80	450	2.40	2,000	3.05	2,750	4.70	5,050
5	1.20	790	1.00	610	0.80	450	2.35	1,950	3.55	3,350	5.65	6,620
6	1.20	790	1.00	610	0.80	450	2.20	1,780	4.55	4,800	6.85	9,000
7	1.20	790	1.00	610	0.80	450	2.20	1,780	5.30	6,000	7.40	10,200
8	1.20	790	1.00	610	0.85	490	2.20	1,780	5.90	7,100	7.10	9,500
9	1.20	790	1.00	610	0.80	450	2.10	1,670	6.10	7,500	6.35	7,900
10	1.20	790	1.00	610	0.90	530	2.00	1,560	5.70	6,700	5.60	6,550
11	1.20	790	1.00	610	0.90	530	2.00	1,560	5.20	5,850	5.15	5,780
12	1.20	790	1.00	610	0.90	530	2.00	1,560	4.70	5,050	5.40	6,200
13	1.10	700	1.00	610	0.90	530	2.25	1,840	4.45	4,620	6 00	7,300
14	1.10	700	1.00	610	0.90	530	2.30	1,890	4.40	4,560	6.50	8,200
15	1.10	700	1.00	610	1.00	610	2.30	1,890	4.35	4,480	6.95	9,200
16	1.10	700	1.00	610	1.25	830	2.85	2,500	3.60	3,400	7.40	10,200
17	1.10	700	1.00	610	1.30	880	2.85	2,500	3.85	3,780	7.50	10,400
18	1.10	700	1.00	610	1.35	920	3.15	2,850	3.95	3,920	7.70	10,800
19	1.10	700	0.90	530	1.30	880	3.40	3,150	4.85	5,280	7.00	99,300
20	1.10	700	....	530	1.25	830	3.80	3,700	5.45	6,280	6.70	8,700
21	1.20	790	0.90	530	1.25	830	3.60	3,400	5.70	6,700	6.70	8,700
22	1.00	610	0.90	530	1.35	920	3.20	2,900	5.60	6,550	6.90	9,100
23	0.80	450	0.90	530	1.50	1,060	3.05	2,750	5.35	6,100	7.05	9,400
24	1.30	450	0.90	530	1.60	1,150	3.05	2,750	5.05	5,600	7.15	9,600
25	1.65	450	0.90	530	1.50	1,060	3.00	2,700	5.00	5,500	7.35	10,100
26	1.95	450	0.90	530	1.40	970	3.00	2,700	4.95	5,420	6.80	8,900
27	2.05	450	0.90	530	1.35	920	3.00	2,700	4.75	5,120	6.20	7,650
28	2.20	450	0.85	490	1.35	920	3.00	2,700	4.90	5,350	6.20	7,650
29	1.80	450	....	....	1.40	970	2.45	2,050	4.75	5,120	6.65	8,570
30	1.60	610	....	....	1.40	970	3.05	2,750	4.40	4,550	7.30	10,000
31	1.40	790	....	....	1.40	970	....	....	4.35	4,480	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	7.95	11,400	8.70	13,200	7.20	9,700	3.60	3,400	2.00	1,560	0.8	450
2	8.35	12,400	8.90	13,700	6.05	7,400	3.25	2,970	1.80	1,350	0.9	530
3	8.65	13,100	9.00	14,000	5.80	6,900	2.90	2,550	1.70	1,250	1.15	740
4	8.95	13,800	8.50	12,700	6.05	7,400	2.80	2,450	1.65	1,200	1.1	700
5	9.15	14,400	7.60	10,600	6.70	8,700	2.30	1,890	1.60	1,150	1.2	790
6	9.30	14,800	7.30	10,000	5.75	6,800	2.30	1,890	1.45	1,010	1.1	700
7	8.85	13,600	6.95	9,200	4.75	5,120	2.05	1,610	1.20	790	0.9	530
8	8.20	12,000	6.95	9,200	4.05	4,050	2.00	1,560	1.15	740	0.9	530
9	7.95	11,400	6.55	8,320	3.70	3,550	1.95	1,500	1.20	790	0.9	530
10	7.65	10,700	6.95	9,200	3.45	3,230	1.80	1,350	1.20	790	0.85	490
11	6.80	8,900	7.20	9,700	3.40	3,150	1.70	1,250	1.20	790	0.8	450
12	6.20	7,650	7.25	9,820	3.40	3,150	1.70	1,250	0.75	410	0.8	450
13	6.15	7,570	6.90	9,100	3.15	2,850	1.60	1,150	0.50	210	0.9	530
14	6.20	7,650	7.00	9,300	2.90	2,550	1.60	1,150	0.90	530	0.8	450
15	6.40	8,000	7.35	10,100	3.50	3,300	1.60	1,150	1.30	880	0.8	450
16	6.65	8,570	7.60	10,600	4.00	4,000	1.50	1,060	1.25	830	0.8	450
17	6.40	8,000	7.55	10,500	4.50	4,700	1.85	1,400	1.25	830	0.7	370
18	6.25	7,730	8.00	11,500	4.55	4,800	2.10	1,670	1.20	790	0.7	370
19	6.50	8,200	7.85	11,200	4.75	5,120	2.20	1,780	1.10	700	0.8	450
20	6.80	8,900	8.35	12,400	4.35	4,480	1.80	1,350	0.95	570	0.9	530
21	7.25	9,830	9.05	14,100	3.90	3,850	1.70	1,250	0.70	370	0.9	530
22	7.75	10,900	9.60	15,500	3.90	3,850	2.50	2,100	0.65	330	0.9	530
23	7.90	11,300	9.25	14,700	3.80	3,700	2.15	1,720	0.90	530	0.9	530
24	7.60	10,600	9.0	14,000	3.90	3,850	1.95	1,500	1.0	610	0.8	450
25	7.60	10,600	8.8	13,500	3.60	3,400	1.85	1,400	1.15	740	0.8	450
26	7.65	10,700	8.45	12,600	3.50	3,300	1.90	1,450	1.1	700	0.80	450
27	7.95	11,400	7.6	10,600	3.40	3,150	2.95	2,620	1.0	610	0.75	410
28	8.35	12,400	7.2	9,700	3.10	2,800	2.80	2,450	0.9	530	0.80	450
29	8.35	12,400	7.3	10,000	3.00	2,700	2.75	2,400	0.8	450	0.80	450
30	7.95	11,400	7.55	10,500	3.55	3,350	2.25	1,830	0.85	490	0.85	490
31	8.15	11,900	8.15	11,900	....	....	2.05	1,610	....	....	0.70	370

NOTE.—Jan. 23-31 gauge raised because of ice conditions. Discharge constant.

Monthly Discharge of Bridge River 30 Miles above Mouth for 1915.

(Drainage area, 1,900 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,250	450	711	0.37	0.43	43,700
February	880	490	601	0.32	0.33	33,400
March	1,150	450	723	0.38	0.44	44,500
April	3,700	970	2,243	1.18	1.32	133,000
May	7,500	2,300	4,939	2.60	3.00	304,000
June	10,800	4,400	8,136	4.28	4.77	484,000
July	14,800	7,570	10,720	5.64	6.50	659,100
August	15,500	9,100	11,340	5.97	6.88	697,300
September	9,700	2,550	4,497	2.37	2.64	267,600
October	3,400	1,060	1,765	0.93	1.07	108,500
November	1,560	210	751	0.40	0.45	44,700
December	790	370	503	0.26	0.30	30,900
The year	15,500	210	3,910	2.06	28.13	2,850,700

CAYUSE CREEK.—(1048).

Location.—At the Pacific Great Eastern Railway trestle, 2 miles from the mouth, and 2½ miles from Lillooet.

Records Available.—Daily discharges from April 8th, 1914, to December 31st, 1915. (Records for 1915 are given herein; for 1914 see previous report.)

Drainage Area.—Three hundred and fifty square miles (measured from the Provincial map of 1912, scale 12 miles to the inch).

Gauge.—Vertical staff gauge, nailed to a pile of the false work of the trestle. Daily gauge readings are taken by Mr. S. Marshall, of Lillooet, B.C.

Channel.—Wide, and of moderate depth, strewn with boulders and coarse gravel. The current is swift at the higher stages. The metering section is a good one.

Discharge Measurements.—Nine discharge measurements taken during 1914 and 1915 give a well defined rating curve.

Winter Flow.—The stream is affected by ice conditions during the winter months.

Accuracy.—"B."

Discharge Measurements of Cayuse River above Seton Creek for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 13	H. C. Hughes	1,057	67	167	0.92	0.14	153
May 8	C. G. Cline	1,505	83	328	6.00	2.25	1,950
June 15	Gordon & Hughes	1,057	82	316	5.90	2.30	1,860
Aug. 6	H. C. Hughes	1,505	75	236	4.57	1.60	1,080
Dec. 2	H. C. Hughes	1,046	71	143	1.35	0.34	193

Daily Gauge Height and Discharge of Cayuse Creek above Seton Creek for 1915.

(Drainage area, 350 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.3	220	0.2	180	0.1	150	0.45	280	1.3	700	1.6	950
2	0.2	180	0.2	180	0.1	150	0.45	280	1.3	700	1.6	950
3	0.2	180	0.2	180	0.15	165	0.8	425	1.3	700	1.6	950
4	0.1	150	0.15	165	0.15	165	0.9	475	1.3	700	1.8	1,185
5	0.1	150	0.15	165	0.2	180	0.9	475	1.4	775	2.0	1,500
6	0.1	150	0.15	165	0.2	180	1.0	525	1.7	1,060	2.4	2,420
7	0.0	125	0.15	165	0.2	180	1.0	525	2.0	1,500	2.5	2,710
8	0.0	125	0.15	165	0.2	180	1.1	575	2.2	1,910	2.4	2,420
9	0.0	125	0.15	165	0.2	180	1.0	525	2.3	2,140	2.2	1,910
10	0.9	475	0.1	150	0.2	180	1.0	525	2.2	1,910	2.0	1,500
11	0.7	385	0.1	150	0.2	180	0.9	475	2.0	1,500	1.9	1,340
12	0.5	300	0.1	150	0.15	165	0.9	475	1.9	1,340	1.9	1,340
13	0.2	180	0.1	150	0.15	165	0.9	475	1.8	1,185	2.0	1,500
14	0.2	180	0.1	150	0.2	180	0.9	475	1.8	1,185	2.1	1,690
15	0.2	180	0.1	150	0.2	180	1.0	525	1.7	1,060	2.3	2,140
16	0.2	180	0.1	150	0.2	180	1.1	575	1.7	1,060	2.4	2,420
17	0.2	180	0.15	165	0.2	180	1.2	635	1.6	950	2.5	2,710
18	0.2	180	0.15	165	0.25	200	1.4	775	1.7	1,060	2.4	2,420
19	0.2	180	0.1	150	0.25	200	1.6	950	1.8	1,185	2.2	1,910
20	0.2	180	0.1	150	0.3	220	1.7	1,060	2.0	1,500	1.9	1,340
21	0.2	180	0.1	150	0.4	260	1.6	950	2.1	1,690	1.9	1,340
22	0.2	180	0.1	150	0.45	280	1.4	775	2.0	1,500	1.9	1,340
23	0.2	180	0.1	150	0.45	280	1.4	775	2.0	1,500	2.0	1,500
24	0.2	180	0.1	150	0.45	280	1.4	775	1.9	1,340	2.1	1,690
25	0.2	180	0.1	150	0.45	280	1.3	700	1.9	1,340	2.2	1,910
26	0.2	180	0.1	150	0.45	280	1.3	700	1.8	1,185	2.0	1,500
27	0.2	180	0.1	150	0.45	280	1.4	775	1.8	1,185	1.9	1,340
28	0.2	180	0.1	150	0.4	260	1.4	775	1.9	1,340	1.9	1,340
29	0.2	180	....	....	0.4	260	1.4	775	1.8	1,185	2.0	1,500
30	0.2	180	....	....	0.45	280	1.3	700	1.7	1,060	2.2	1,910
31	0.2	180	....	....	0.5	300	....	....	1.6	950	....	....

	July.		August.		September.		October.		November.		December.	
1	2.2	1,910	1.8	1,185	1.4	775	0.65	370	0.9	475	0.30	220
2	2.3	2,140	1.8	1,185	1.3	700	0.65	370	0.8	425	0.30	220
3	2.3	2,140	1.7	1,060	1.2	635	0.60	350	0.8	425	0.30	220
4	2.4	2,420	1.7	1,060	1.2	635	0.60	350	0.8	425	0.20	180
5	2.4	2,420	1.7	1,060	1.2	635	0.60	350	0.7	385	0.30	220
6	2.3	2,140	1.7	1,060	1.2	635	0.60	350	0.7	385	0.20	180
7	2.2	1,910	1.6	950	1.1	575	0.50	300	0.7	385	0.30	220
8	2.1	1,690	1.6	950	1.0	525	0.50	300	0.6	350	0.35	240
9	2.0	1,500	1.6	950	0.9	475	0.50	300	0.5	300	0.35	240
10	1.9	1,340	1.6	950	0.8	425	0.50	300	0.5	300	0.30	220
11	1.8	1,185	1.5	850	0.8	425	0.50	300	0.4	260	0.30	220
12	1.7	1,060	1.5	850	0.8	425	0.50	300	0.4	260	0.30	220
13	1.6	950	1.4	775	0.8	425	0.50	300	0.4	260	0.25	200
14	1.7	1,060	1.4	775	0.7	385	0.40	260	0.4	260	0.25	200
15	1.7	1,060	1.4	775	0.7	385	0.40	260	0.4	260	0.20	180
16	1.8	1,185	1.4	775	0.7	385	0.40	260	0.4	260	0.20	180
17	1.7	1,060	1.6	950	0.6	350	0.40	260	0.4	260	0.10	150
18	1.6	950	1.6	950	0.6	350	0.40	260	0.4	260	0.10	150
19	1.7	1,060	1.7	1,060	0.6	350	0.40	260	0.4	260	0.10	150
20	1.8	1,185	1.6	950	0.7	385	0.45	280	0.35	240	0.20	180
21	1.9	1,340	1.5	850	0.7	385	0.50	300	0.35	240	0.30	220
22	2.0	1,500	1.5	850	0.7	385	0.60	350	0.35	240	0.25	200
23	1.9	1,340	1.6	950	0.7	385	0.70	385	0.35	240	0.20	180
24	1.8	1,185	1.6	950	0.7	385	0.70	385	0.35	240	0.20	180
25	1.8	1,185	1.5	850	0.6	350	0.80	425	0.35	240	0.20	180
26	1.9	1,340	1.5	850	0.6	350	0.85	450	0.35	240	0.10	150
27	2.0	1,500	1.4	775	0.6	350	1.00	525	0.35	240	0.10	150
28	2.1	1,690	1.4	775	0.6	350	1.20	635	0.35	240	0.10	150
29	2.0	1,500	1.3	700	0.55	325	1.30	700	0.30	220	0.10	150
30	1.9	1,340	1.4	775	0.65	370	1.20	635	0.30	220	0.10	150
31	1.8	1,185	1.4	775	0	... ...	1.00	525	....		0.10	150

Monthly Discharge of Cayuse Creek above Seton Lake for 1915.

(Drainage area, 350 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	475	125	193	0.55	0.63	11,900
February	180	150	157	0.45	0.47	8,720
March	300	150	213	0.61	0.70	13,100
April	1,060	280	624	1.78	1.99	37,100
May	2,140	700	1,240	3.54	4.08	76,200
June	2,710	950	1,690	4.83	5.39	101,000
July	2,420	950	1,470	4.20	4.84	90,400
August	1,185	700	910	2.60	3.00	56,000
September	775	325	450	1.29	1.44	26,800
October	700	260	370	1.06	1.22	22,700
November	475	220	295	0.84	0.94	17,600
December	240	150	190	0.54	0.62	11,700
The year	2,710	125	650	1.86	25.32	473,220

CHEAKAMUS RIVER.—(1034).

Location.—Highway bridge, about 1 mile from the mouth and 10 miles from Squamish.

Records Available.—Daily discharges from March 11, 1914, to December 31, 1915. (Records for 1915 are given herein, for 1914, see previous report.)

Drainage Area.—Above the measuring section, 250 square miles (from the Provincial map of 1912, scale 17.75 miles to the inch).

Gauge.—Cable gauge from the highway bridge. Daily gauge readings by Mr. C. Voeltzel.

Channel.—Wide and shallow. The bed is rough and strewn with boulders.

Discharge Measurements.—Thirteen discharge measurements were made during 1914 and 1915.

Winter Flow.—Open water conditions all winter.

Accuracy.—"C."

Discharge Measurements of Cheakamus River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 2	H. C. Hughes	1,521	130	245	3.02	1.55	738
Feb. 24	H. C. Hughes	1,521	131	233	3.20	1.70	746
May 28	C. G. Cline	1,505	140	444	7.00	3.15	3,010
June 10	Hughes & Gordon	1,057	140	467	5.30	3.40	2,500
June 12	Hughes & Gordon	1,057	140	502	5.24	3.92	2,634
Aug. 18	H. C. Hughes	1,505	140	560	6.07	4.10	3,400
Dec. 8	H. C. Hughes	1,046	140	470	5.71	3.10	2,690

Daily Gauge Height and Discharge of Cheakamus River at Checkye for 1915

(Drainage area, 250 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.2	550	1.2	550	1.8	860	4.5	4,850	2.5	1,430	2.45	1,380
2	1.6	750	1.3	600	1.8	860	7.75	12,880	2.5	1,430	2.55	1,480
3	1.9	920	1.4	650	1.8	860	6.8	10,500	2.7	1,650	2.55	1,480
4	1.4	650	1.3	600	1.8	860	4.9	5,800	3.3	2,450	3.15	2,220
5	1.4	650	1.3	600	1.8	860	3.9	3,550	3.7	3,150	3.35	2,530
6	1.3	600	1.5	700	1.8	860	3.9	3,550	4.0	3,750	3.55	2,880
7	1.3	600	1.5	700	1.9	920	3.8	3,350	4.0	3,750	3.85	3,450
8	1.3	600	1.5	700	1.8	860	3.7	3,150	3.9	3,550	3.45	2,680
9	1.3	600	1.6	750	1.8	860	3.5	2,800	3.9	3,550	3.15	2,220
10	1.3	600	1.6	750	1.7	800	3.5	2,800	3.8	3,350	3.30	2,450
11	2.1	1,070	1.6	750	1.75	830	4.0	3,750	3.7	3,150	3.60	2,950
12	2.1	1,070	1.6	750	1.6	750	3.8	3,350	3.7	3,150	3.7	3,150
13	1.9	920	1.5	700	1.6	750	3.6	2,950	3.5	2,800	3.9	3,550
14	1.7	800	1.5	700	2.68	1,630	3.5	2,800	3.3	2,450	4.0	3,750
15	1.5	700	1.5	700	4.4	4,600	3.5	2,800	3.1	2,150	4.1	3,950
16	1.3	600	1.5	700	3.6	2,950	3.6	2,950	3.1	2,150	4.1	3,950
17	1.3	600	1.7	800	2.9	1,890	3.5	2,800	3.15	2,220	4.1	3,950
18	1.2	550	1.6	750	2.7	1,650	3.7	3,150	3.2	2,300	4.1	3,950
19	1.1	510	1.5	700	2.7	1,650	3.9	3,550	3.3	2,450	3.6	2,950
20	1.1	510	1.5	700	2.7	1,650	3.7	3,150	3.5	2,800	3.8	3,350
21	1.1	510	1.5	700	2.9	1,890	3.5	2,800	3.7	3,150	4.0	3,750
22	1.0	480	1.5	700	3.4	2,600	3.3	2,450	3.7	3,150	4.0	3,750
23	1.0	480	1.5	700	3.2	2,300	3.2	2,300	3.4	2,600	4.2	4,150
24	1.0	480	1.7	800	3.0	2,020	3.0	2,020	3.1	2,150	4.3	4,400
25	0.9	450	1.9	920	2.6	1,530	2.7	1,650	3.0	2,020	4.4	4,600
26	0.9	450	1.8	860	2.3	1,230	2.7	1,650	3.0	2,020	3.8	3,350
27	0.9	450	1.8	860	2.1	1,070	2.6	1,530	3.3	2,450	3.6	2,950
28	0.9	450	1.9	920	2.1	1,070	2.6	1,530	3.4	2,600	4.0	3,750
29	0.9	450	....	....	2.1	1,070	2.6	1,530	2.85	1,830	4.3	4,400
30	0.9	450	....	....	2.5	1,430	2.5	1,430	2.45	1,380	4.4	4,600
31	1.0	480	....	....	2.6	1,530	....	....	2.35	1,280	....	....

	July.		August.		September.		October.		November.		December.	
1	4.5	4,850	4.4	4,600	4.5	4,850	3.1	2,150	....	....	....	....
2	4.7	5,300	4.3	4,400	3.8	3,350	3.2	2,300	....	....	....	....
3	4.9	5,800	4.3	4,400	3.7	3,150	2.9	1,890	....	....	....	....
4	5.1	6,250	4.1	3,950	3.8	3,350	2.5	1,430	....	....	....	....
5	4.9	5,800	4.1	3,950	3.5	2,800	2.5	1,430	....	....	....	....
6	4.7	5,300	4.0	3,750	3.3	2,450	2.3	1,230	....	....	....	....
7	4.2	4,150	3.9	3,550	3.3	2,450	2.2	1,150	....	....	2.9	1,890
8	3.6	2,950	3.9	3,550	3.2	2,300	2.1	1,070	....	....	3.2	2,300
9	4.6	5,100	4.0	3,750	3.1	2,150	2.0	990	....	....	2.8	1,770
10	4.4	4,600	4.1	3,950	2.9	1,890	2.0	990	....	....	2.2	1,150
11	4.3	4,400	4.1	3,950	2.8	1,770	2.0	990	....	....	2.1	1,070
12	4.1	3,950	4.1	3,950	2.7	1,650	2.1	1,070	....	....	2.0	990
13	4.0	3,750	4.1	3,950	2.7	1,650	2.2	1,150	....	....	2.0	990
14	3.9	3,550	4.1	3,950	2.8	1,770	2.1	1,070	....	....	2.0	990
15	3.8	3,350	4.2	4,150	2.8	1,770	2.1	1,070	....	....	1.9	920
16	3.8	3,350	4.3	4,400	2.8	1,770	2.1	1,070	....	....	1.8	860
17	3.8	3,350	4.4	4,600	2.9	1,890	3.0	2,020	....	....	1.7	800
18	3.8	3,350	4.1	3,950	2.9	1,890	2.4	1,330	....	....	1.7	800
19	3.8	3,350	4.3	4,400	3.0	2,020	2.3	1,230	....	....	1.6	750
20	4.1	3,950	4.7	5,300	3.0	2,020	2.4	1,330	....	....	2.1	1,070
21	4.3	4,400	4.7	5,300	2.9	1,890	6.25	9,125	....	....	2.7	1,650
22	4.3	4,400	4.7	5,300	2.9	1,890	4.4	4,600	....	....	2.4	1,330
23	4.2	4,150	4.3	4,400	2.9	1,890	3.8	3,350	....	....	2.1	1,070
24	4.1	3,950	4.5	4,850	2.8	1,770	3.6	2,950	....	....	2.0	990
25	4.5	4,850	4.5	4,850	2.8	1,770	5.6	7,500	....	....	1.9	920
26	4.5	4,850	4.0	3,750	2.7	1,650	5.8	8,000	....	....	1.8	860
27	4.4	4,600	4.1	3,950	2.7	1,650	5.6	7,500	....	....	1.7	800
28	4.2	4,150	4.1	3,950	2.7	1,650	5.2	6,500	....	....	1.6	750
29	4.2	4,150	4.4	4,600	2.9	1,890	5.0	6,050	....	....	1.6	750
30	4.1	3,950	4.4	4,600	3.2	2,300	4.2	4,150	....	....	1.5	750
31	4.1	3,950	4.5	4,850	....	....	....	4,000	....	....	....	...

Monthly Discharge of Cheakamus River at Checkye for 1915.

(Drainage area, 250 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,070	450	612	2.45	2.83	37,600
February	920	550	725	2.90	3.02	40,300
March	4,600	800	1,440	5.76	6.64	88.500
April	12,880	1,430	3,450	13.80	15.40	205,000
May	3,750	1,280	2,530	10.12	11.66	155,600
June	4,600	1,380	3,270	13.08	14.59	195,000
July	6,250	3,350	4,320	17.30	19.90	266,000
August	5,300	3,550	3,960	15.80	18.20	243,000
September	4,850	1,650	2,180	8.72	9.73	130,000
October	9,125	990	2,930	11.80	13.60	180,000
The period	12,880	450	2,542	10.17	115.57	1,541,000

NOTE.—No continuous readings during November and December.

FOSTER BAR CREEK.—(1074).

Location.—Above the irrigation ditches, 19 miles below Lillooet.

Records Available.—Daily discharges from June 22 to September 30, 1915.

Drainage Area.—Twenty square miles.

Gauge.—Vertical staff gauge. Daily gauge readings are taken by Mr. C. McGillivary of the Halfway House, Lytton, B.C.

Channel.—Boulders and gravel, with good control.

Discharge Measurements.—Three discharge measurements give a well defined rating curve for the range of the stream.

Winter Flow.—The gauge is only read during the irrigation season.

Accuracy.—"B."

FOSTER BAR CREEK.—(1074).

Foster Bar creek rises in the mountains south-west of Lillooet, flows in a south-westerly direction and discharges into the Fraser river, twenty-three miles below Lillooet, at an elevation of 450 feet. The drainage area is twenty square miles.

The climate in the watershed of this stream is much similar to that of the Lillooet district. The summers are hot and the winters rather severe. The mean annual precipitation is about ten inches. This increases very much with the altitude.

The Fraser river benches adjacent to the mouth of this stream are well suited to cultivation when irrigated. At present the normal flow of the stream is being used for this purpose. So far no investigations have been made with a view to storing the high water flow.

Discharge Measurements of Foster Bar Creek above Irrigation Ditches for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
June 22	Gordon & Hughes	1,057	7	2.50	2.10	0.85	5.32
Aug. 10	H. C. Hughes	1,505	8	1.95	1.06	0.60	2.06
Dec. 4	H. C. Hughes	1,046	7	1.19	0.81	0.45	0.95

Daily Gauge Height and Discharge of Foster Bar Creek above Ditches for 1915.

(Drainage area, 20 square miles.)

	June.		July.		August.		September.					
1	....	....	0.75	3.7	0.65	2.5	0.50	1.3	....	....	....	....
2	....	....	0.75	3.7	0.65	2.5	0.50	1.3	....	....	....	....
3	....	....	0.75	3.7	0.65	2.5	0.50	1.3	....	....	....	....
4	....	....	0.75	3.7	0.65	2.5	0.50	1.3	....	....	....	....
5	....	....	0.75	3.7	0.60	2.1	0.50	1.3	....	....	....	....
6	....	....	0.75	3.7	0.60	2.1	0.50	1.3	....	....	....	....
7	....	....	0.70	3.0	0.60	2.1	0.50	1.3	....	....	....	....
8	....	....	0.70	3.0	0.60	2.1	0.50	1.3	....	....	....	....
9	....	....	0.70	3.0	0.60	2.1	0.50	1.3	....	....	....	....
10	....	....	0.70	3.0	0.60	2.1	0.50	1.3	....	....	....	....
11	....	....	0.70	3.0	0.60	2.1	0.50	1.3	....	....	....	....
12	....	....	0.70	3.0	0.60	2.1	0.50	1.3	....	....	....	....
13	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
14	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
15	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
16	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
17	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
18	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
19	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
20	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
21	....	....	0.70	3.0	0.60	2.1	0.45	1.0	....	....	....	....
22	0.85	5.5	0.65	2.5	0.60	2.1	0.45	1.0	....	....	....	....
23	0.80	4.4	0.65	2.5	0.55	1.7	0.45	1.0	....	....	....	....
24	0.80	4.4	0.65	2.5	0.55	1.7	0.45	1.0	....	....	....	....
25	0.80	4.4	0.65	2.5	0.55	1.7	0.45	1.0	....	....	....	....
26	0.80	4.4	0.65	2.5	0.55	1.7	0.45	1.0	....	....	....	....
27	0.80	4.4	0.65	2.5	0.55	1.7	0.45	1.0	....	....	....	....
28	0.80	4.4	0.70	3.0	0.55	1.7	0.45	1.0	....	....	....	....
29	0.80	4.4	0.70	3.0	0.50	1.3	0.45	1.0	....	....	....	....
30	0.80	4.4	0.70	3.0	0.50	1.3	0.45	1.0	....	....	....	....
31	....	....	0.70	3.0	0.50	1.3	....	....	....	....	....	....

Monthly Discharge of Foster Bar Creek above Ditches for 1915.

(Drainage area, 20 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
July	3.7	2.5	3.04	0.15	0.17	187.0
August	2.5	1.3	2.00	0.10	0.11	123.0
September	1.3	1.0	1.10	0.06	0.07	65.5
The period	3.7	1.0	2.04	0.10	0.35	375.5

NOTE.—Station established in July, 1915 and maintained throughout the irrigation season.

FOUNTAIN CREEK.—(1047).

Location.—Above the irrigation ditches, 1½ mile from the mouth and 10 miles from Lillooet.

Records Available.—Daily discharges from June to October, 1914, and from April to October, 1915. (Records for 1915 are given herein, those for 1914 are tabulated in a previous report.)

Drainage Area.—Twenty square miles (measured from the Provincial map of 1913, scale 12 miles to the inch).

Gauge.—Vertical staff gauge. Daily gauge readings are taken by Mr. E Peterson, of Lillooet, B.C.

Channel.—Wide and shallow, gravel bottom. The current is fairly swift. The control is good.

Discharge Measurements.—Five discharge measurements taken during 1915 give a fairly well defined rating curve.

Winter Flow.—The gauge readings are discontinued during the winter months.

Accuracy.—"C."

Discharge Measurements of Fountain Creek above Irrigation Ditches for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 21	C. G. Cline	1,505	12	6.60	3.65	1.30	24.1
June 18	Gordon & Hughes	1,057	11	5.80	3.45	1.30	20.0
Aug. 7	H. C. Hughes	1,505	11	4.75	2.82	1.15	13.4
Dec. 3	H. C. Hughes	1,046	8	2.70	1.12	1.04	3.0

Daily Gauge Height and Discharge of Fountain Creek above Ditches for 1915.

(Drainage area, 20 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	......	......	0.9	1	1.5	39
2	......	......	......	......	......	......	......	......	1.0	2	1.5	39
3	......	......	......	......	......	......	......	......	1.0	2	1.5	39
4	......	......	......	......	......	......	......	......	1.0	2	1.5	39
5	......	......	......	......	......	......	......	......	1.0	2	1.4	31
6	......	......	......	......	......	......	......	......	1.0	2	1.4	31
7	......	......	......	......	......	......	......	......	1.0	2	1.4	31
8	......	......	......	......	......	......	......	......	1.0	2	1.4	31
9	......	......	......	......	......	......	......	......	1.0	2	1.4	31
10	......	......	......	......	......	......	......	......	1.0	2	1.4	31
11	......	......	......	......	......	......	......	......	1.0	2	1.4	31
12	......	......	......	......	......	......	0.9	1	0.9	1	1.4	31
13	......	......	......	......	......	......	0.9	1	1.0	2	1.4	31
14	......	......	......	......	......	......	0.9	1	1.1	7	1.4	31
15	......	......	......	......	......	......	0.9	1	1.1	7	1.4	31
16	......	......	......	......	......	......	1.0	2	1.1	7	1.4	31
17	......	......	......	......	......	......	1.0	2	1.1	7	1.4	31
18	......	......	......	......	......	......	1.0	2	1.2	15	1.4	31
19	......	......	......	......	......	......	1.0	2	1.2	15	1.4	31
20	......	......	......	......	......	......	1.0	2	1.3	23	1.3	23
21	......	......	......	......	......	......	1.0	2	1.4	31	1.3	23
22	......	......	......	......	......	......	0.9	1	1.4	31	1.3	23
23	......	......	......	......	......	......	0.9	1	1.4	31	1.3	23
24	......	......	......	......	......	......	0.9	1	1.5	39	1.3	23
25	......	......	......	......	......	......	1.0	2	1.5	39	1.3	23
26	......	......	......	......	......	......	1.0	2	1.5	39	1.3	23
27	......	......	......	......	......	......	1.0	2	1.5	39	1.3	23
28	......	......	......	......	......	......	1.0	2	1.5	39	1.3	23
29	......	......	......	......	......	......	1.0	2	1.5	39	1.3	23
30	......	......	......	......	......	......	1.0	2	1.5	39	1.3	23
31	......	......	......	......	......	......	......	......	1.5	39	......	......

	July.		August.		September.		October.		November.		December.	
1	1.2	15	1.2	15	1.0	2	1.0	2	......	......	......	......
2	1.2	15	1.1	7	1.0	2	1.0	2	......	......	......	......
3	1.2	15	1.1	7	1.0	2	1.0	2	......	......	......	......
4	1.2	15	1.1	7	1.0	2	1.0	2	......	......	......	......
5	1.2	15	1.3	23	1.0	2	1.0	2	......	......	......	......
6	1.2	15	1.3	23	1.0	2	1.0	2	......	......	......	......
7	1.1	7	1.2	15	1.0	2	0.9	1	......	......	......	......
8	1.1	7	1.2	15	1.0	2	1.0	2	......	......	......	......
9	1.2	15	1.1	7	1.0	2	......	......	......	......	......	......
10	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
11	1.2	15	1.1	7	1.0	2	......	......	......	......	......	......
12	1.2	15	1.2	15	1.0	2	......	......	......	......	......	......
13	1.2	15	1.2	15	1.0	2	......	......	......	......	......	......
14	1.2	15	1.2	15	1.0	2	......	......	......	......	......	......
15	1.2	15	1.1	7	1.0	2	......	......	......	......	......	......
16	1.2	15	1.1	7	1.0	2	......	......	......	......	......	......
17	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
18	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
19	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
20	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
21	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
22	1.1	7	1.0	2	1.0	2	......	......	......	......	......	......
23	1.3	23	1.0	2	1.0	2	......	......	......	......	......	......
24	1.3	23	1.0	2	1.0	2	......	......	......	......	......	......
25	1.3	23	1.0	2	1.0	2	......	......	......	......	......	......
26	1.3	23	1.1	7	1.0	2	......	......	......	......	......	......
27	1.3	23	1.2	15	1.0	2	......	......	......	......	......	......
28	1.3	23	1.2	15	1.0	2	......	......	......	......	......	......
29	1.2	15	1.1	7	1.0	2	......	......	......	......	......	......
30	1.2	15	1.0	2	1.0	2	......	......	......	......	......	......
31	1.2	15	1.0	2	......	......	......	......	......	......	......	......

Monthly Discharge of Fountain Creek above Ditches for 1915.

(Drainage area, 20 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	39	1	16.0	0.80	0.92	984
June	39	23	29.0	1.45	1.62	1,730
July	23	7	15.8	0.79	0.91	972
August	23	2	8.2	0.41	0.47	504
September	2	2	2.0	0.10	0.11	119
The period	39	1	14.2	0.70	4.03	4,309

Note.—Station maintained only during the irrigarion season; that is from May to September, 1915.

FRASER RIVER.—(1072).

AT LILLOOET.

Location.—Pacific Great Eastern Railway trestle at Lillooet.

Records Available.—Daily discharges from May 14, to December 31, 1915.

Drainage Area.—Sixty-two thousand five hundred square miles—from Provincial map of 1912.

Gauge.—Cable gauge from the trestle. Gauge readings are taken twice a day by Mr. J. W. Burke, of Lillooet, B.C.

Channel.—Wide, and fairly deep. The current is very swift at the higher stages of the water. The bottom is covered with gravel and boulders.

Discharge Measurements.—Three discharge measurements, taken in 1915, outline the rating curve.

Winter Flow.—Open water throughout the year.

Accuracy.—"D," because of insufficient meter measurements.

FRASER RIVER AT LILLOOET.—(1072).

For a complete description of the Fraser river refer to the report of the Railway Belt Hydrometric Survey, 1911-12, Water Resources Paper No. 1.

This station was established at Lillooet on May 14, 1915, to obtain accurate data on the discharge of the Fraser river above its confluence with the Thompson river. The gauge on the Fraser at Lytton was found to be affected by backwater from the Thompson river.

Discharge Measurements of Fraser River at Lillooet, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 15	C. G. Cline	1,505	580	8,540	10.40	23.30	88.800
June 26	Gordon & Hughes	1,057	580	9,800	11.00	25.50	108,000
Dec. 6	H. C. Hughes	1,046	538	5,800	3.31	16.02	19,200

Note.—Station established May 15, 1915.

Daily Gauge Height and Discharge of Fraser River at Lillooet for 1915.

(Drainage area, 62,500 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	......	......	......	......	24.8	102,000
2	......	......	......	......	......	......	......	......	......	......	23.7	91,000
3	......	......	......	......	......	......	......	......	......	......	23.8	92,000
4	......	......	......	......	......	......	......	......	......	......	23.9	93,000
5	......	......	......	......	......	......	......	......	......	......	24.1	95,000
6	......	......	......	......	......	......	......	......	......	......	24.3	97,000
7	......	......	......	......	......	......	......	......	......	......	24.4	98,000
8	......	......	......	......	......	......	......	......	......	......	24.3	97,000
9	......	......	......	......	......	......	......	......	......	......	24.3	97,000
10	......	......	......	......	......	......	......	......	......	......	24.3	97,000
11	......	......	......	......	......	......	......	......	......	......	24.2	96,000
12	......	......	......	......	......	......	......	......	......	......	24.2	96,000
13	......	......	......	......	......	......	......	......	......	......	24.1	95,000
14	......	......	......	......	......	......	......	......	23.3	87,000	24.0	94,000
15	......	......	......	......	......	......	......	......	23.3	87,000	24.0	94,000
16	......	......	......	......	......	......	......	......	23.1	85,000	24.0	94,000
17	......	......	......	......	......	......	......	......	23.0	84,000	24.3	97,000
18	......	......	......	......	......	......	......	......	22.9	83,000	24.7	101,000
19	......	......	......	......	......	......	......	......	23.0	84,000	25.3	107,000
20	......	......	......	......	......	......	......	......	23.1	85,000	25.5	109,000
21	......	......	......	......	......	......	......	......	23.3	87,000	26.3	117,000
22	......	......	......	......	......	......	......	......	23.6	90,000	25.9	113,000
23	......	......	......	......	......	......	......	......	23.8	92,000	25.4	108,000
24	......	......	......	......	......	......	......	......	24.0	94,000	25.4	108,000
25	......	......	......	......	......	......	......	......	24.4	98,000	25.4	108,000
26	......	......	......	......	......	......	......	......	25.2	106,000	25.2	106,000
27	......	......	......	......	......	......	......	......	25.4	108,000	25.6	110,000
28	......	......	......	......	......	......	......	......	25.6	110,000	25.6	110,000
29	......	......	......	......	......	......	......	......	25.7	111,000	26.4	118,000
30	......	......	......	......	......	......	......	......	25.5	109,000	26.6	120 000
31	......	......	......	......	......	......	......	......	25.3	107,000	......	......

	July.		August.		September.		October.		November.		December.	
1	26.1	115,000	24.7	101,000	22.6	80,000	......	42,600	19.4	48,800	15.3	13,600
2	26.4	118,000	24.7	101,000	22.4	78,000	......	41,100	19.1	46,100	15.5	15,200
3	26.1	115,000	24.9	103,000	22.3	77,000	18.4	39,600	18.8	43,200	15.9	18,400
4	26.1	115,000	24.8	102,000	22.1	75,000	18.4	39,600	18.7	42,300	16.0	19,200
5	26.0	114,000	24.7	101,000	21.9	73,000	18.4	39,600	18.4	39,600	15.9	18,400
6	25.9	113,000	24.5	99,000	21.5	69,000	18.4	39,600	18.2	37,800	16.0	19,200
7	25.6	110,000	24.2	96,000	21.3	67,000	18.3	38,700	18.1	36,900	16.15	20,400
8	25.2	106,000	24.0	94,000	21.0	64,000	18.3	38,700	17.9	35,100	15.95	18,800
9	25.0	104,000	23.7	91,000	20.7	61,100	18.2	37,800	17.6	32,400	15.60	16,000
10	24.9	103,000	23.6	90,000	20.3	57,300	18.1	36,900	17.5	31,500	15.15	12,500
11	24.8	102,000	23.5	89,000	19.8	52,600	18.0	36,000	17.3	29,800	15.25	13,200
12	24.9	103,000	23.5	89,000	19.4	48,800	17.9	35,100	16.8	25,600	15.15	12,500
13	27.5	129,000	23.5	89,000	19.0	45,200	17.8	34,200	16.4	22,400	15.05	11,800
14	29.1	145,000	23.4	88,000	18.7	42,300	17.8	34,200	16.2	20,800	15.25	13,200
15	28.1	135,000	23.3	87,000	18.6	41,400	17.9	35,100	16.2	20,800	15.30	13,600
16	27.3	127,000	23.3	87,000	18.7	42,300	18.1	36,900	16.3	21,600	15.20	12,900
17	26.8	122,000	23.2	86,000	18.8	43,200	18.5	40,500	16.4	22,400	15.10	12,200
18	26.3	117,000	23.3	87,000	19.0	45,200	18.7	42,300	16.5	23,200	15.15	12,500
19	26.1	115,000	23.4	88,000	20.1	55,500	19.0	45,200	16.6	24,000	15.00	11,500
20	25.8	112,000	23.6	90,000	19.4	48,800	19.3	47,900	16.5	23,200	15.25	13,200
21	25.8	112,000	24.0	94,000	19.6	50,600	19.3	47,900	16.4	22,400	15.10	12,200
22	25.7	111,000	24.3	97,000	19.8	52,600	19.2	47,000	16.3	21,600	15.20	12,900
23	25.4	108,000	24.2	96,000	19.8	52,600	19.1	46,100	16.2	20,800	15.20	12,900
24	25.1	105,000	24.0	94,000	19.7	51,600	19.0	45,200	16.1	20,000	15.20	12,900
25	25.0	104,000	23.9	93,000	19.4	48,800	18.9	44,200	16.0	19,200	14.95	11,100
26	25.1	105,000	23.7	91,000	19.3	47,900	18.8	43,200	15.9	18,400	14.85	10,400
27	25.1	105,000	23.4	88,000	19.2	47,000	18.8	43,200	16.0	19,200	14.75	9,700
28	25.1	105,000	23.3	87,000	19.1	46,100	18.8	43,200	15.7	16,800	14.85	10,400
29	25.1	105,000	23.1	85,000	18.9	44,200	19.6	50,600	15.6	16,000	14.95	11,100
30	25.1	105,000	23.0	84,000	18.9	44,200	20.1	55,500	15.1	12,200	14.85	10,400
31	25.1	105,000	22.9	83,000	......	......	20.0	54,600	......	......	14.95	11,100

Monthly Discharge of Fraser River at Lillooet for 1915.

(Drainage area, 62,500 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	120,000	91,000	102,000	1.63	1.82	6,070,000
July	145,000	105,000	113,000	1.81	2.09	6,950,000
August	103,000	83,000	91,900	1.47	1.70	5,650,000
September	80,000	41,400	55,100	0.88	0.98	3,280,000
October	55,500	34,200	42,000	0.67	0.77	2,580,000
November	48,800	12,200	27,100	0.43	0.48	1,610,000
December	20,400	10,400	13,700	0.22	0.25	842,000
The period	145,000	10,400	63,543	1.01	8.09	26,982,000

Note.—Station established May 14, 1915.

GREEN RIVER AT NAIRN FALLS.—(1035).

Location.—Five miles from the mouth, 3 miles from Pemberton.

Records Available.—Daily discharges from November, 1913, to December, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Drainage area, as measured from the Provincial map of 1912 (scale 17.75 miles to the inch), is 180 square miles.

Gauge.—Sloping staff gauge bolted to rocks. Daily gauge readings are taken by Mr. L. Merson, of Pemberton, B.C.

Channel.—Wide and fairly deep. Rock and gravel bottom,—a good metering section with a good control.

Discharge Measurements.—Twenty-seven meter measurements taken during 1913-14-15 give a very well defined rating curve.

Winter Flow.—The stream is affected by ice during the winter months.

Accuracy.—"A" below discharge of 13,300 cubic feet per second.

"B" above discharge of 13,300 cubic feet per second.

Discharge Measurements of Green River above Nairn Falls for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 21	C. E. Dobbie	1,057	78	185	1.20	0.10	231
Feb. 6	Dobbie & Hughes	1,057	78	167	1.41	2.15	238
Mar. 9	C. E. Dobbie	1,057	78	202	1.62	2.35	327
Mar. 14	C. E. Dobbie	1,057	78	230	1.90	2.68	441
Mar. 15	C. E. Dobbie	1,057	78	354	3.20	4.25	1,140
Mar. 22	C. E. Dobbie	1,057	81	416	4.00	5.10	1,650
Mar. 23	C. E. Dobbie	1,057	81	458	4.20	5.50	1,920
Mar. 27	C. E. Dobbie	1,057	80	261	3.38	3.90	882
April 3	C. E. Dobbie	1,057	100	826	6.40	8.80	5,300
April 4	C. E. Dobbie	1,057	95	652	5.30	7.30	3,470
April 11	C. E. Dobbie	1,057	81	408	3.43	4.80	1,400
April 29	C. G. Cline	1,057	83	400	3.60	4.95	1,440
May 25	C. G. Cline	1,505	81	465	4.80	6.10	2,210
June 14	Hughes & Gordon	1,057	98	603	4.90	6.95	3,000
Aug. 5	H. C. Hughes	1,505	96	596	4.79	6.65	2,830

Daily Gauge Height and Discharge of Green River at Nairn Falls for 1915.

(Drainage area, 180 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.50	350	2.50	350	2.25	280	4.3	1,120	....	1,220	5.9	2,130
2	2.50	350	2.35	300	2.22	260	9.2	5,540	4.3	1,120	5.7	1,990
3	2.60	390	2.25	280	2.25	280	9.6	6,020	4.4	1,170	6.0	2,210
4	2.50	350	....	270	2.30	290	7.4	3,490	5.8	2,060	6.2	2,370
5	2.50	350	....	250	2.35	300	6.3	2,450	6.7	2,810	8.3	4,460
6	2.50	350	2.15	240	2.38	310	5.9	2,130	7.3	3,390	8.0	4,130
7	2.45	330	2.15	240	2.40	320	5.9	2,130	8.2	4,350	8.2	4,350
8	2.45	330	2.15	240	2.40	320	5.5	1,850	8.0	4,130	7.8	3,910
9	2.45	330	2.15	240	2.35	300	5.0	1,520	7.8	3,910	7.4	3,490
10	2.45	330	2.15	240	2.42	330	4.7	1,340	7.0	3,090	....	3,190
11	2.50	350	2.15	240	2.50	350	4.8	1,400	6.8	2,900	6.8	2,900
12	2.50	350	2.15	240	2.48	340	5.6	1,920	6.0	2,210	6.9	2,990
13	2.40	320	2.10	230	2.50	350	5.9	2,130	6.0	2,210	7.2	3,290
14	2.40	320	2.10	230	2.68	420	5.2	1,640	6.2	2,370	7.3	3,390
15	2.35	300	2.10	230	4.20	1,070	5.1	1,580	5.8	2,060	7.6	3,690
16	2.45	330	2.10	230	4.20	1,070	6.1	2,290	5.4	1,780	7.8	3,910
17	2.35	300	2.15	240	4.00	970	6.1	2,290	5.4	1,780	8.0	4,130
18	2.35	300	2.15	240	4.60	1,280	6.5	2,630	5.6	1,920	7.3	3,390
19	2.30	290	2.05	220	4.38	1,160	6.7	2,810	6.2	2,370	6.8	2,900
20	2.30	290	2.05	220	4.10	1,020	6.8	2,900	6.8	2,900	7.0	3,090
21	2.10	230	2.15	240	4.40	1,170	5.7	1,990	7.0	3,090	6.9	2,990
22	2.10	230	2.15	240	5.10	1,580	5.3	1,710	6.6	2,720	7.0	3,090
23	....	280	2.18	250	5.60	1,920	5.2	1,640	6.3	2,450	7.5	3,590
24	2.40	320	2.18	250	4.90	1,460	5.3	1,710	5.8	2,060	7.8	3,910
25	....	370	2.25	280	4.50	1,220	4.95	1,490	5.8	2,060	7.3	3,390
26	....	420	2.20	260	4.10	1,020	5.10	1,580	5.6	1,920	7.0	3,090
27	2.85	490	2.20	260	3.90	920	5.00	1,520	6.0	2,210	6.7	2,810
28	3.30	670	2.20	260	3.70	830	4.7	1,340	6.4	2,540	6.4	2,540
29	3.30	670	....	....	3.75	850	5.0	1,520	6.0	2,210	6.1	2,290
30	3.10	590	....	....	3.90	920	....	1,400	5.7	1,990	7.6	3,690
31	2.40	320	....	....	4.0	970	....	....	5.4	1,780	....	....

	July.		August.		September.		October.		November.		December.	
1	8.2	4,350	8.4	4,580	6.4	2,540	4.1	1,020	4.3	1,120	2.5	350
2	8.7	4,940	8.1	4,240	6.6	2,720	4.1	1,020	4.3	1,120	2.5	350
3	8.9	5,180	8.3	4,460	6.1	2,290	4.1	1,020	4.0	970	2.5	350
4	9.4	5,780	7.4	3,490	7.0	3,090	3.9	920	4.0	970	2.6	390
5	9.8	6,260	6.8	2,900	6.3	2,450	3.7	830	4.0	970	2.7	430
6	9.6	6,020	6.9	2,990	6.0	2,210	3.5	750	3.8	870	2.8	470
7	9.2	5,540	6.6	2,720	5.4	1,780	3.3	670	3.6	790	2.8	470
8	8.8	5,060	6.3	2,450	4.8	1,400	3.1	590	3.6	790	2.7	430
9	8.2	4,350	6.9	2,990	4.6	1,280	3.0	550	3.4	710	2.7	430
10	8.0	4,130	7.0	3,090	4.6	1,280	2.8	470	3.2	630	2.7	430
11	7.3	3,390	7.2	3,290	4.2	1,070	2.7	430	3.2	630	2.6	390
12	7.0	3,090	6.4	2,540	4.0	970	2.8	470	3.0	550	2.5	350
13	6.8	2,900	6.8	2,900	4.0	970	2.8	470	2.8	470	2.4	320
14	6.3	2,450	7.5	3,590	4.3	1,120	2.9	510	2.8	470	2.4	320
15	6.6	2,720	7.2	3,290	4.6	1,280	3.0	550	2.8	470	2.4	320
16	7.1	3,190	7.0	3,090	4.8	1,400	3.1	590	2.8	470	2.4	320
17	6.8	2,900	7.6	3,690	4.8	1,400	3.2	630	2.7	430	2.4	320
18	6.8	2,900	7.8	3,910	5.0	1,520	3.2	630	2.7	430	2.4	320
19	7.1	3,190	8.9	5,180	5.3	1,710	3.4	710	2.7	430	2.4	320
20	7.4	3,490	8.6	4,820	5.6	1,920	3.7	830	2.6	390	2.4	320
21	7.3	3,390	9.0	5,300	5.0	1,520	4.0	970	2.6	390	2.5	350
22	8.2	4,350	9.2	5,540	4.8	1,400	4.2	1,070	2.6	390	2.6	390
23	8.0	4,130	8.4	4,580	4.6	1,280	4.4	1,170	2.6	390	2.6	390
24	8.0	4,130	9.0	5,300	4.8	1,400	4.4	1,170	2.7	430	2.5	350
25	7.9	4,020	8.3	4,460	4.5	1,220	4.7	1,340	2.7	430	2.5	350
26	7.6	3,690	7.6	3,690	4.5	1,220	8.0	4,130	2.7	430	2.5	350
27	8.2	4,350	6.9	2,990	4.7	1,340	6.4	2,540	2.6	390	2.5	350
28	8.0	4,130	7.2	3,290	4.2	1,070	7.0	3,090	2.6	390	2.4	320
29	8.3	4,460	7.7	3,800	4.2	1,070	6.0	2,210	2.6	390	2.4	320
30	8.7	4,940	8.0	4,130	4.9	1,460	5.0	1,520	2.5	350	2.4	320
31	8.1	4,240	7.2	3,290	....	....	4.3	1,120	....	....	2.4	320

Monthly Discharge of Green River at Nairn Falls for 1915.

(Drainage area, 180 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	670	230	361	2.01	2.32	22,200
February	350	220	250	1.39	1.45	13,900
March	1,920	260	770	4.28	4.93	47,300
April	6,020	1,120	2,170	12.05	13.45	129,000
May	4,350	1,120	2,410	13.40	15.45	148,000
June	4,460	1,990	3,240	18.00	20.08	193,000
July	6,260	2,450	4,120	22.90	26.40	253,000
August	5,540	2,450	3,760	20.90	24.10	231,000
September	3,090	970	1,580	8.78	9.80	94,000
October	4,130	430	1,100	6.11	7.04	67,600
November	1,120	350	589	3.27	3.65	35,000
December	470	320	362	2.01	2.32	22,300
The year	6,260	220	1,726	9.59	130.99	1,256,300

LALUWISSIN CREEK.—(1050).

Location.—Above the irrigation ditches, about 1 mile from the mouth and 26 miles from Lillooet, section 30, township 27, range 17, west of 6th meridian.

Records Available.—Daily discharges from June to September, 1914, and from April to December, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Twenty square miles (measured from the Provincial map of 1913, scale 12 miles to the inch.)

Gauge.—Vertical staff gauge. Daily gauge readings taken by Mr. J. E. Maher, of Lillooet, B.C.

Channel.—Shallow, and strewn with boulders and coarse gravel. The current is fairly swift. The metering section is a good one.

Discharge Measurements.—Four meter measurements taken during 1915 give a well defined rating curve.

Winter Flow.—Stream affected by ice in winter months.

Accuracy.—"B."

Discharge Measurements of Laluwissin Creek above Irrigation Ditches for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 20	C. G. Cline	1,505	5.5	5.32	4.40	1.70	23.6
June 22	Hughes & Gordon	1,057	6.0	3.15	2.50	1.45	8.0
Aug. 10	H. C. Hughes	1,505	7.5	2.80	1.26	1.30	3.5
Dec. 4	H. C. Hughes	1,046	6.0	1.99	1.00	1.20	2 0

Daily Gauge Height and Discharge of Laluwissin Creek above Irrigation Ditches for 1915.

(Drainage area, 20 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	......	......	1.5	10	1.65	20
2	......	......	......	......	......	......	......	......	1.4	6	1.65	20
3	......	......	......	......	......	......	......	......	1.4	6	1.6	16
4	......	......	......	......	......	......	......	......	1.4	6	1.6	16
5	......	......	......	......	......	......	......	......	1.4	6	1.6	16
6	......	......	......	......	......	......	......	......	1.4	6	1.6	16
7	......	......	......	......	......	......	......	......	1.5	10	1.6	16
8	......	......	......	......	......	......	......	......	1.5	10	1.6	16
9	......	......	......	......	......	......	......	......	1.5	10	1.55	13
10	......	......	......	......	......	......	1.2	2	1.5	10	1.55	13
11	......	......	......	......	......	......	1.2	2	1.5	10	1.5	10
12	......	......	......	......	......	......	1.2	2	1.5	10	1.5	10
13	......	......	......	......	......	......	1.2	2	1.5	10	1.5	10
14	......	......	......	......	......	......	1.3	4	1.5	10	1.5	10
15	......	......	......	......	......	......	1.4	6	1.5	10	1.5	10
16	......	......	......	......	......	......	1.4	6	1.5	10	1.5	10
17	......	......	......	......	......	......	1.4	6	1.55	13	1.5	10
18	......	......	......	......	......	......	1.5	10	1.6	16	1.5	10
19	......	......	......	......	......	......	1.5	10	1.7	24	1.5	10
20	......	......	......	......	......	......	1.5	10	1.7	24	1.5	10
21	......	......	......	......	......	......	1.5	10	1.75	29	1.45	8
22	......	......	......	......	......	......	1.5	10	1.75	29	1.4	6
23	......	......	......	......	......	......	1.5	10	1.75	29	1.4	6
24	......	......	......	......	......	......	1.5	10	1.7	24	1.45	8
25	......	......	......	......	......	......	1.5	10	1.7	24	1.5	10
26	......	......	......	......	......	......	1.5	10	1.7	24	1.5	10
27	......	......	......	......	......	......	1.5	10	1.7	24	1.5	10
28	......	......	......	......	......	......	1.5	10	1.65	20	1.5	10
29	......	......	......	......	......	......	1.5	10	1.65	20	1.45	8
30	......	......	......	......	......	......	1.5	10	1.65	20	1.45	8
31	......	......	......	......	......	......	......	......	1.65	20	......	......

	July.		August.		September.		October.		November.		December.	
1	1.45	8.1	1.40	6.3	1.25	2.8	1.20	2.0	1.25	2.8	1.15	1.6
2	1.40	6.3	1.35	5.0	1.25	2.8	1.20	2.0	1.25	2.8	1.15	1.6
3	1.40	6.3	1.35	5.0	1.25	2.8	1.20	2.0	1.25	2.8	1.20	2.0
4	1.40	6.3	1.35	5.0	1.25	2.8	1.20	2.0	1.25	2.8	1.20	2.0
5	1.40	6.3	1.30	3.7	1.25	2.8	1.25	2.8	1.20	2.0	1.20	2.0
6	1.40	6.3	1.30	3.7	1.25	2.8	1.25	2.8	1.20	2.0	1.20	2.0
7	1.40	6.3	1.30	3.7	1.25	2.8	1.20	2.0	1.20	2.0	1.20	2.0
8	1.40	6.3	1.30	3.7	1.25	2.8	1.20	2.0	1.20	2.0	1.20	2.0
9	1.40	6.3	1.30	3.7	1.25	2.8	1.20	2.0	1.20	2.0	1.55	1.6
10	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.20	2.0	1.15	1.6
11	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.20	2.0	1.15	1.6
12	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.20	2.0	1.15	1.6
13	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.15	1.6	1.15	1.6
14	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.15	1.6	1.15	1.6
15	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.15	1.6	1.15	1.6
16	1.35	5.0	1.30	3.7	1.25	2.8	1.20	2.0	1.10	1.2	1.20	2.0
17	1.35	5.0	1.30	3.7	1.20	2.0	1.20	2.0	1.10	1.2	1.20	2.0
18	1.35	5.0	1.30	3.7	1.20	2.0	1.20	2.0	1.10	1.2	1.20	2.0
19	1.35	5.0	1.30	3.7	1.20	2.0	1.20	2.0	1.10	1.2	1.15	1.6
20	1.35	5.0	1.30	3.7	1.20	2.0	1.20	2.0	1.15	1.6	1.15	1.6
21	1.35	5.0	1.30	3.7	1.20	2.0	1.20	2.0	1.15	1.6	1.15	1.6
22	1.30	3.7	1.30	3.7	1.20	2.0	1.20	2.0	1.20	2.0	1.20	2.0
23	1.30	3.7	1.30	3.7	1.20	2.0	1.25	2.8	1.20	2.0	1.20	2.0
24	1.30	3.7	1.25	2.8	1.15	1.6	1.25	2.8	1.20	2.0	1.20	2.0
25	1.30	3.7	1.25	2.8	1.15	1.6	1.25	2.8	1.20	2.0	1.20	2.0
26	1.30	3.7	1.25	2.8	1.15	1.6	1.25	2.8	1.15	1.6	1.20	2.0
27	1.35	5.0	1.20	2.0	1.15	1.6	1.25	2.8	1.15	1.6	1.20	2.0
28	1.40	6.3	1.20	2.0	1.15	1.6	1.25	2.8	1.15	1.6	1.20	2.0
29	1.40	6.3	1.20	2.0	1.15	1.6	1.25	2.8	1.15	1.6	1.15	1.6
30	1.40	6.3	1.25	2.8	1.15	1.6	1.25	2.8	1.15	1.6	1.15	1.6
31	1.40	6.3	1.25	2.8	......	......	1.25	2.8	......	......	1.15	1.6

Monthly Discharge of Laluwissin River above Irrigation Ditches for 1915.

(Drainage area, 20 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	29.0	6.0	15.50	0.78	0.90	953
June	20.0	6.0	11.50	0.58	0.65	684
July	8.1	3.7	5.39	0.27	0.31	331
August	6.3	2.0	3.60	0.18	0.21	221
September	2.8	1 6	2.33	0.12	0.13	139
October	2.8	2.0	2.29	0.11	0.13	141
November	2.8	1.6	1.87	0.09	0.10	111
December	2.0	1.6	1.81	0.09	0.10	111
The period	29 0	1.6	5.54	0.28	2.53	2,691

Note.—Station maintained throughout the irrigation season and also till end of year for storage data.

LILLOOET RIVER.—(1038).

Location.—Government highway bridge at Agerton, 1½ mile from Pemberton, and 8 miles above Lillooet lake.

Records Available.—Daily discharges from November 16, 1913, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Eight hundred square miles.

Gauge.—Vertical staff gauge nailed to the central pier of the bridge. Daily gauge readings are taken by Mr. N. J. Baker, of Pemberton, B.C.

Channel.—Wide and deep, with smooth sandy bottom. An excellent measuring section.

Discharge Measurements.—Twelve meter measurements taken during 1914 and 1915 give a well defined rating curve.

Winter Flow.—The stream is affected by ice conditions during the winter months.

Accuracy.—"A."

Discharge Measurements of Lillooet River 6 Miles above Lillooet Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 8	Dobbie & Hughes	1,057	175	460	1.73	2.08	778[1]
Feb. 22	Dobbie & Hughes	1,057	175	366	1.95	1.00	712
May 24	C. G. Cline	1,505	181	1,527	3.38	5.35	5,170
June 13	Hughes & Gordon	1,057	188	1,753	4.26	7.35	7,580
Aug. 4	H. C. Hughes	1,505	191	2,220	5.10	8.60	11,300
Dec. 1	H. C. Hughes	1,046	175	444	2.00	1.50	886

[1] Ice cover.

Daily Gauge Height and Discharge of Lillooet River 6 Miles above Lillooet Lake for 1915.

(Drainage area, 800 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.8	2,470	2.0	700	1.2	900	3.0	2,670	3.2	2,870	5.0	4,930
2	2.8	2,470	2.0	700	1.2	900	3.4	2,990	3.1	2,770	5.4	5,440
3	2.7	2,380	2.0	700	1.3	1,000	5.1	5,050	3.1	2,770	5.4	5,440
4	2.7	2,380	2.0	700	1.3	1,000	4.5	4,320	3.5	3,200	6.8	7,480
5	2.6	2,280	2.0	700	1.3	1,000	4.0	3,750	3.8	3,530	7.3	8,420
6	2.4	2,090	2.0	700	1.3	1,000	3.7	3,420	5.4	5,440	7.6	9,030
7	2.3	2,000	2.0	700	1.2	900	3.5	3,200	7.0	7,850	7.6	9,030
8	2.3	2,000	2.0	700	1.2	900	3.2	2,870	6.8	7,480	7.0	7,850
9	2.0	1,700	2.1	700	1.2	900	3.0	2,670	6.8	7,480	6.4	6,840
10	2.0	1,700	2.0	700	1.2	900	3.0	2,670	6.4	6,840	5.9	6,110
11	1.8	1,500	1.5	700	1.3	1,000	3.4	2,990	6.0	6,250	6.0	6,250
12	1.8	1,500	1.0	700	1.3	1,000	3.4	2,990	5.3	5,210	6.9	7,660
13	1.5	1,200	1.0	700	1.3	1,000	3.9	3,640	5.2	5,180	6.9	7,660
14	1.5	1,200	1.0	700	1.5	1,200	3.6	3,310	5.0	4,930	7.3	8,420
15	1.3	1,000	1.0	700	2.1	1,800	3.5	3,200	4.9	4,810	8.1	10,210
16	1.3	1,000	1.0	700	2.1	1,800	4.0	3,750	4.8	4,690	8.3	10,700
17	1.3	1,000	1.0	700	2.2	1,900	4.3	4,080	4.5	4,320	8.2	10,450
18	1.3	1,000	1.0	700	2.3	2,000	4.6	4,440	4.5	4,320	7.6	9,030
19	1.2	900	1.0	700	2.5	2,190	4.6	4,440	5.4	5,440	7.3	8,420
20	1.2	900	1.0	700	2.6	2,280	4.5	4,320	5.8	5,970	7.5	8,820
21	1.1	800	1.0	700	2.8	2,470	4.5	4,320	6.2	5,540	7.6	9,030
22	1.0	700	1.0	700	3.0	2,670	4.2	3,970	5.9	6,110	8.0	9,970
23	1.0	700	1.0	700	3.0	2,670	4.0	3,750	5.7	5,830	8.0	9,970
24	1.0	700	1.1	800	3.0	2,670	4.0	3,750	5.4	5,440	8.1	10,210
25	1.2	700	1.2	900	2.8	2,470	3.8	3,530	5.4	5,440	7.5	8,820
26	1.2	700	1.2	900	2.8	2,470	3.8	3,530	5.4	5,440	7.1	8,040
27	1.2	700	1.2	900	2.5	2,190	3.7	3,420	5.4	5,440	7.4	8,620
28	1.3	700	1.2	900	2.5	2,190	3.7	3,420	5.2	5,180	7.4	8,620
29	1.6	700	....	....	2.3	2,000	3.5	3,200	5.2	5,180	8.1	10,210
30	1.8	700	....	....	2.3	2,000	3.2	2,870	4.9	4,810	9.0	12,520
31	2.0	700	....	....	2.3	2,000	....	....	4.9	4,810	....	....

	July.		August.		September.		October.		November.		December.	
1	9.6	14,180	11.1	18,600	7.4	8,620	5.3	5,210	3.5	3,200	1.6	1,300
2	10.0	15,310	11.3	19,200	7.4	8,620	4.8	4,690	3.2	2,870	1.6	1,300
3	11.0	18,300	10.5	16,800	8.2	10,450	4.6	4,440	3.0	2,670	1.7	1,400
4	11.2	18,900	8.0	9,970	9.3	13,340	3.6	3,310	2.7	2,380	1.7	1,400
5	11.3	19,200	7.5	8,820	8.5	11,200	3.7	3,420	2.6	2,280	1.8	1,500
6	10.8	17,700	7.8	9,490	7.1	8,040	3.2	2,870	2.7	2,380	2.0	1,700
7	10.5	16,800	8.0	9,970	5.9	6,110	3.0	2,670	2.4	2,090	2.0	1,700
8	10.0	15,310	7.9	9,730	5.2	5,180	2.8	2,470	2.3	2,000	1.8	1,500
9	8.8	11,980	8.2	10,450	4.8	4,690	2.6	2,280	2.2	1,900	1.8	1,500
10	8.3	10,700	9.5	13,900	5.0	4,930	2.5	2,190	2.0	1,700	1.7	1,400
11	7.8	9,490	7.6	9,030	5.5	5,570	2.4	2,090	2.0	1,700	1.6	1,300
12	7.4	8,620	7.6	9,030	5.2	5,180	2.2	1,900	1.9	1,600	1.6	1,300
13	7.0	7,850	8.6	11,450	4.6	4,440	2.1	1,800	2.0	1,700	1.6	1,300
14	7.7	9,250	9.8	14,740	5.0	4,930	2.1	1,800	2.0	1,700	1.6	1,300
15	8.4	10,950	10.0	15,310	5.4	5,440	2.0	1,700	1.9	1,600	1.5	1,200
16	8.0	9,970	9.5	13,900	5.8	5,970	2.2	1,900	1.9	1,600	1.5	1,200
17	7.8	9,490	10.1	15,600	6.9	7,660	2.5	2,190	1.9	1,600	1.5	1,200
18	7.4	8,620	9.0	12,520	7.0	7,850	3.2	2,870	1.9	1,600	1.5	1,200
19	8.2	10,450	10.3	16,200	6.3	6,690	3.0	2,670	1.8	1,500	1.5	1,200
20	9.0	12,520	11.1	18,600	6.0	6,250	2.8	2,470	1.7	1,400	1.6	1,300
21	8.7	11,710	11.4	19,500	5.7	5,830	3.6	3,310	1.7	1,400	1.6	1,300
22	8.8	11,980	11.3	19,200	5.4	5,440	4.4	4,200	1.7	1,400	1.6	1,300
23	9.0	12,520	11.1	18,600	5.1	5,050	3.3	2,980	1.7	1,400	1.6	1,300
24	9.0	12,520	11.1	18,600	5.5	5,570	3.1	2,770	1.7	1,400	1.5	1,200
25	9.1	12,790	10.9	18,000	6.0	6,250	2.7	2,380	1.7	1,400	1.6	1,300
26	9.1	12,790	9.0	12,520	4.6	4,440	4.1	3,860	1.8	1,500	1.6	1,300
27	10.3	16,200	7.9	9,730	4.8	4,810	5.4	5,440	1.7	1,400	2.7	2,380
28	9.8	14,740	8.8	11,980	4.4	4,200	6.8	7,480	1.6	1,300	3.0	2,670
29	10.1	15,600	9.2	13,060	4.4	4,200	4.9	4,810	1.6	1,300	2.9	2,570
30	10.2	15,900	9.0	12,520	4.2	3,970	3.9	3,640	1.6	1,300	3.1	2,770
31	11.1	18,600	8.4	10,950	....	....	3.6	3,310	....	....	3.1	2,770

NOTE.—From January 23 to February 12, gauge raised because of ice conditions, no increase in the discharge.

Monthly Discharge of Lillooet River 6 Miles above Lillooet Lake for 1915.

(Drainage area, 800 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	2,470	700	1,300	1.62	1.87	79,900
February	900	700	730	0.91	0.95	40.500
March	2,670	900	1,660	2.08	2.40	102,000
April	5,050	2,670	3,550	4.44	4.95	211,000
May	7,850	2,770	5,180	6.48	7.47	318,000
June	12,520	4,930	8,470	10.60	11.83	504,000
July	19,200	7,850	13,200	16.50	19.00	812,000
August	19,500	8,820	13,800	17.30	19.90	849,000
September	13.340	3,970	6,360	7.95	8.87	378,000
October	7,480	1,700	3,200	4.00	4.61	197,000
November	3,200	1,300	1,780	2.22	2.48	106,000
December	2,770	1,200	1,550	1.94	2.24	95,300
The year	19,500	700	5,065	6.34	86.57	3,692,700

PAVILION CREEK.—(1073).

Location.—Above the ditches, 22 miles above Lillooet.

Records Available.—Daily discharges from June 19 to September 30, 1915.

Drainage Area.—Eighty-two square miles, taken from the Provincial Government map, 1913.

Gauge.—Vertical staff gauge. Daily gauge readings are taken by Mr. C. A. Shaw.

Channel.—Wide and shallow. The bottom is of sand and gravel.

Discharge Measurements.—Three discharge measurements taken during 1915 define the rating curve fairly well.

Winter Flow.—Records kept only during the irrigation season.

Accuracy.—"B."

PAVILION CREEK.—(1073).

Pavilion creek rises in the mountains west of Pavilion, flows in a southwesterly direction and discharges into the Fraser river twenty-two miles above Lillooet. It drains Pavilion lake which is about three miles long and a third of a mile wide.

It has two large tributaries, both entering from the right. The total drainage area of Pavilion creek is 82 square miles.

The climate in the Pavilion creek valley resembles that of the Lillooet district generally. The summers are very hot, and the winters severe. The mean annual precipitation in the watershed is about ten inches.

The valley of Pavilion creek and its tributaries, and the adjacent benches on the Fraser river are well adapted to cultivation by irrigation; the water from the stream being used for this purpose. Some attempt has been made to regulate the flow to give sufficient water for the low water season. A small timber dam at the outlet of the lake stores the water which comes down during the spring and early summer freshets. When this water is required a sluice gate in the dam is opened and the water is allowed to flow down the natural channel of the stream to the irrigation ditches.

Considerable water is diverted from the tributaries which are above the gauging station.

The discharge data given for this stream is computed from the flow at the metering section and does not include water diverted above the section.

Discharge Measurements of Pavilion Creek above Irrigation Ditches for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
June 19	Hughes & Gordon	1,057	14	10.0	2.08	1.45	21.0
Aug. 7	H. C. Hughes	1,505	13	9.5	1.77	1.38	16.8
Dec. 3	H. C. Hughes	1,046	8	1.6	0.70	0.71	1.1

Daily Gauge Height and Discharge of Pavilion Creek above Ditches for 1915.

(Drainage area, 82 square miles.)

Day.	June.		July.		August.		September.		October.		November.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			1.3	13.0	1.45	21.0	1.3	13.0				
2			1.3	13.0	1.45	21.0	1.3	13.0				
3			1.3	13.0	1.45	21.0	1.3	13.0				
4			1.25	11.2	1.4	18.3	1.3	13.0				
5			1.25	11.2	1.4	18.3	1.3	13.0				
6			1.2	9.4	1.35	15.6	1.3	13.0				
7			1.2	9.4	1.4	18.3	1.3	13.0				
8			1.2	9.4	1.4	18.3	1.25	11.2				
9			1.2	9.4	1.35	15.6	1.25	11.2				
10			1.15	8.0	1.3	13.0	1.25	11.2				
11			1.15	8.0	1.3	13.0	1.25	11.2				
12			1.15	8.0	1.3	13.0	1.2	9.4				
13			1.2	9.4	1.3	13.0	1.15	8.0				
14			1.25	11.2	1.3	13.0	1.1	6.7				
15			1.3	13.0	1.3	13.0	1.1	6.7				
16			1.3	13.0	1.3	13.0	1.1	6.7				
17			1.25	11.2	1.35	15.6	1.05	5.7				
18			1.2	9.4	1.4	18.3	0.95	3.9				
19	1.45	21.0	1.2	9.4	1.4	18.3	0.9	3.2				
20	1.40	18.3	1.2	9.4	1.35	15.6	0.9	3.2				
21	1.35	15.6	1.15	8.0	1.35	15.6	1.45	21.0				
22	1.30	13.0	1.15	8.0	1.3	13.0	1.45	21.0				
23	1.30	13.0	1.15	8.0	1.3	13.0	1.45	21.0				
24	1.35	15.6	1.3	13.0	1.3	13.0	1.45	21.0				
25	1.30	13.0	1.3	13.0	1.3	13.0	0.9	3.2				
26	1.40	18.3	1.3	13.0	1.3	13.0	0.9	3.2				
27	1.45	21.0	1.4	18.3	1.25	11.2	0.85	2.6				
28	1.40	18.3	1.4	18.3	1.25	11.2	0.9	3.2				
29	1.35	15.6	1.45	21.0	1.25	11.2	0.9	3.2				
30	1.35	15.6	1.50	24.0	1.3	13.0	0.95	3.9				
31			1.45	21.0	1.3	13.0						

Monthly Discharge of Pavilion Creek near Pavilion, B.C., for 1915.

(Drainage area, 82 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
July	24.0	8.0	12.10	0.15	0.17	744
August	21.0	11.2	15.00	0.18	0.21	922
September	21.0	2.6	9.75	0.12	0.13	580
The period	24.0	2.6	12.28	0.15	0.51	2,246

Note.—The station was established in June, 1915, and gauge readings were continued throughout the irrigation season; that is, to September 30, 1915.

SETON CREEK.—(1049).

Location.—At the foot bridge at the provincial hatchery, ½ mile below Seton lake, and 3 miles from Lillooet.

Records Available.—Daily discharges from April 6, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—460 square miles, measured from the Provincial map of 1912 (scale 12 miles to the inch).

Gauge.—Vertical staff gauge nailed to bridge pier. Daily gauge readings are taken by Mr. J. B. Arthur of the Provincial hatchery, Lillooet, B.C.

Channel.—Wide and shallow, strewn with boulders. The current is very swift at the higher stages of the water.

Discharge Measurements.—Nine discharge measurements taken during 1914 and 1915 give a well defined rating curve.

Winter Flow.—Open water conditions all year.

Accuracy.—"B."

Discharge Measurements of Seton Creek below Seton Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 13	H. C. Hughes	1,057	75	85	2.78	1.43	236
May 10	C. G. Cline	1,505	74	171	5.10	2.55	875
June 15	Gordon & Hughes	1,057	77	322	4.45	3.20	1,430
Aug. 6	H. C. Hughes	1,505	75	190	5.45	2.75	1,040
Dec. 2	H. C. Hughes	1,046	66	89	2.66	1.43	236

Daily Gauge Height and Discharge of Seton Creek below Seton Lake for 1915.

(Drainage area, 460 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.6	300	1.4	230	1.4	230	1.4	230	2.2	620	3.0	1,260
2	1.6	300	1.4	230	1.4	230	1.4	230	2.2	620	3.0	1,260
3	1.6	300	1.4	230	1.4	230	1.4	230	2.2	620	3.0	1,260
4	1.6	300	1.4	230	1.4	230	1.5	260	2.2	620	3.0	1,260
5	1.6	300	1.4	230	1.4	230	1.5	260	2.2	620	2.9	1,170
6	1.6	300	1.4	230	1.4	230	1.5	260	2.3	690	2.9	1,170
7	1.6	300	1.4	230	1.4	230	1.5	260	2.3	690	3.0	1,260
8	1.6	300	1.4	230	1.3	200	1.6	300	2.4	760	3.0	1,260
9	1.6	300	1.4	230	1.3	200	1.6	300	2.5	840	3.0	1,260
10	1.6	300	1.4	230	1.3	200	1.6	300	2.6	920	3.1	1,350
11	1.6	300	1.4	230	1.3	200	1.6	300	2.6	920	3.1	1,350
12	1.6	300	1.4	230	1.3	200	1.6	300	2.7	1,000	3.2	1,440
13	1.6	300	1.4	230	1.3	200	1.6	300	2.7	1,000	3.2	1,440
14	1.6	300	1.4	230	1.3	200	1.7	350	2.7	1,000	3.2	1,440
15	1.6	300	1.4	230	1.3	200	1.7	350	2.8	1,080	3.2	1,440
16	1.6	300	1.4	230	1.3	200	1.8	400	2.8	1,080	3.2	1,440
17	1.6	300	1.4	230	1.3	200	1.8	400	2.9	1,170	3.2	1,440
18	1.6	300	1.4	230	1.3	200	1.9	450	2.9	1,170	3.2	1,440
19	1.6	300	1.4	230	1.3	200	1.9	450	2.9	1,170	3.3	1,550
20	1.6	300	1.4	230	1.3	200	1.9	450	2.9	1,170	3.3	1,550
21	1.5	260	1.4	230	1.3	200	1.9	450	2.9	1,170	3.4	1,660
22	1.5	260	1.4	230	1.3	200	2.0	500	3.0	1,260	3.4	1,660
23	1.5	260	1.4	230	1.3	200	2.0	500	3.0	1,260	3.4	1,660
24	1.4	230	1.4	230	1.4	230	2.1	560	3.0	1,260	3.4	1,660
25	1.4	230	1.4	230	1.4	230	2.1	560	3.1	1,350	3.4	1,660
26	1.4	230	1.4	230	1.4	230	2.2	620	3.1	1,350	3.4	1,660
27	1.4	230	1.4	230	1.4	230	2.2	620	3.1	1,350	3.4	1,660
28	1.4	230	1.4	230	1.4	230	2.2	620	3.1	1,350	3.4	1,660
29	1.4	230	....	....	1.4	230	2.1	560	3.1	1,350	3.3	1,550
30	1.4	230	....	....	1.4	230	2.2	620	3.1	1,350	3.3	1,550
31	1.4	230	....	....	1.4	230	....	....	3.1	1,350	....	....

	July.		August.		September.		October.		November.		December.	
1	3.3	1,550	3.0	1,260	2.8	1,080	1.7	350	1.5	260	1.4	230
2	3.3	1,550	3.1	1,350	2.7	1,000	1.7	350	1.5	260	1.4	230
3	3.3	1,550	3.2	1,440	2.6	920	1.7	350	1.5	260	1.4	230
4	3.3	1,550	3.2	1,440	2.6	920	1.7	350	1.5	260	1.4	230
5	3.4	1.660	3.2	1.440	2.5	840	1.6	300	1.6	300	1.4	230
6	3.4	1,660	2.8	1,080	2.5	840	1.6	300	1.6	300	1.4	230
7	3.5	1,760	2.9	1,170	2.4	760	1.6	300	1.6	300	1.4	230
8	3.5	1,760	2.8	1,080	2.3	690	1.6	300	1.6	300	1.4	230
9	3.5	1,760	2.8	1,080	2.3	690	1.6	300	1.5	260	1.4	230
10	3.5	1,760	2.8	1,080	2.2	620	1.6	300	1.5	260	1.4	230
11	3.4	1,660	2.8	1,080	2.2	620	1.5	260	1.5	260	1.4	230
12	3.4	1,660	2.8	1,080	2.2	620	1.5	260	1.5	260	1.4	230
13	3.4	1,660	2.8	1,080	2.1	560	1.5	260	1.5	260	1.5	260
14	3.3	1,550	2.7	1,000	2.1	560	1.5	260	1.5	260	1.5	260
15	3.3	1,550	2.7	1,000	2.0	500	1.4	230	1.5	260	1.5	260
16	3.3	1,550	2.7	1,000	2.0	500	1.4	230	1.5	260	1.5	260
17	3.3	1,550	2.8	1,080	2.0	500	1.4	230	1.5	260	1.7	350
18	3.2	1,440	2.8	1,080	2.0	500	1.4	230	1.5	260	1.7	350
19	3.0	1,260	2.8	1,080	1.9	450	1.4	230	1.5	260	1.6	300
20	3.0	1,260	2.8	1,080	1.9	450	1.3	200	1.5	260	1.6	300
21	3.0	1,260	2.8	1,080	1.9	450	1.3	200	1.4	230	1.6	300
22	3.0	1,260	2.7	1,000	1.9	450	1.3	200	1.4	230	1.6	300
23	3.0	1,260	2.7	1,000	1.9	450	1.3	200	1.4	230	1.6	300
24	3.0	1,260	2.8	1,080	1.8	400	1.3	200	1.4	230	1.6	300
25	3.0	1,260	2.8	1,080	1.8	400	1.3	200	1.4	230	1.6	300
26	3.0	1,260	2.8	1,080	1.8	400	1.3	200	1.4	230	1.6	300
27	3.0	1,260	2.8	1,080	1.8	400	1.4	230	1.4	230	1.6	300
28	3.1	1,350	2.8	1,080	1.7	350	1.5	260	1.4	230	1.6	300
29	3.1	1,350	2.8	1,080	1.7	350	1.5	260	1.4	230	1.6	300
30	3.1	1,350	2.8	1,080	1.7	350	1.5	260	1.4	230	1.6	300
31	3.1	1,350	2.8	1,080	....	....	1.5	260	....	....	1.5	260

Monthly Discharge of Seton Creek below Seton Lake for 1915.

(Drainage area, 460 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	300	230	278	0.60	0.69	17,100
February	230	230	230	0.50	0.52	12,800
March	230	200	215	0.47	0.54	13,200
April	620	230	400	0.87	0.97	23,800
May	1,350	620	1,040	2.26	2.61	63,900
June	1,660	1,170	1,450	3.16	3.53	86,300
July	1,760	1,260	1,480	3.22	3.71	91,000
August	1,440	1,000	1,120	2.44	2.81	68,900
September	1,080	350	587	1.28	1.43	34,900
October	350	200	260	0.56	0.65	16,000
November	300	230	255	0.56	0.62	15,200
December	350	230	270	0.59	0.68	16,600
The year	1,760	200	632	1.38	18.76	459,700

SIX MILE CREEK.—(1061).

Location.—At the highway bridge 1 mile from the mouth, 5 miles from Pemberton, and 56 miles from Squamish.

Records Available.—Daily discharges from June 2, 1914, to April 30, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Thirty square miles (measured from the Provincial map of 1913, scale 3 miles to the inch).

Gauge.—Vertical staff gauge on bridge pier. Daily gauge readings are taken by Mr. C. E. Dobbie.

Channel.—Wide and shallow. Strewn with boulders and coarse gravel. The current is very swift.

Discharge Measurements.—Five meter measurements made during 1914-15 give a well defined rating curve, except for very high stages of the water.

Winter Flow.—The stream is affected by ice only during the extreme cold weather.

Accuracy.—"C."

Discharge Measurements of Six Mile Creek near Mouth for 1915.

Date.		Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
				Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan.	19	C. E. Dobbie	1,057	21	19.6	2.93	1.25	57.3[1]
Feb.	5	Dobbie & Hughes	1,057	22	28.0	1.57	1.13	43.9[1]
Mar.	17	C. E. Dobbie	1,057	52	72.0	2.30	1.90	164.0[2]
Mar.	16	C. E. Dobbie	1,057	41	58.0	3.50	1.90	203.0[3]
April	12	C. E. Dobbie	1,057	42	76.6	5.45	2.55	418.0[4]
April	20	C. E. Dobbie	1,057	44	98.0	6.80	2.95	668.0[4]
April	29	Cline & Dobbie	1,057	42	78.8	4.70	2.45	370.0[4]
May	25	C. G. Cline	1,505	43	71.8	5.80	2.85	413.0[4]

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[1] Section below highway bridge, wading measurements.
[2] Foot bridge.
[3] Highway bridge.
[4] Foot bridge surface velocities.

Daily Gauge Height and Discharge of Six Mile Creek 5 Miles from Pemberton for 1915.

(Drainage area, 30 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.40	80	....	53	1.18	48	2.05	215	....	....	....	....
2	....	80	1.20	50	1.20	50	....	560	....	....	....	....
3	1.40	80	1.15	45	1.17	47	3.4	910	....	....	....	....
4	1.25	57	1.15	45	....	48	....	675	....	....	....	....
5	1.35	72	1.15	45	1.20	50	2.7	440	....	....	....	....
6	....	72	....	44	1.25	57	2.55	370	....	....	....	....
7	1.35	72	1.13	43	1.25	57	2.55	370	....	....	....	....
8	....	72	....	43	1.15	45	....	330	....	....	....	....
9	1.35	72	1.13	43	1.38	77	2.3	290	....	....	....	....
10	1.35	72	1.13	43	1.25	57	2.2	260	....	....	....	....
11	....	64	1.10	40	1.30	65	2.3	290	....	....	....	....
12	....	58	....	37	1.30	65	2.55	370	....	....	....	....
13	1.20	50	1.05	35	1.30	65	2.55	370	....	....	....	....
14	1.30	65	1.10	40	....	148	2.4	320	....	....	....	....
15	1.20	50	1.10	40	2.10	230	2.35	305	....	....	....	....
16	1.30	65	1.10	40	1.9	180	2.55	370	....	....	....	....
17	1.25	57	1.13	43	1.9	180	2.75	465	....	....	....	....
18	1.25	57	1.13	43	....	190	2.85	515	....	....	....	....
19	1.25	57	....	40	2.00	200	2.95	570	....	....	....	....
20	1.25	57	1.08	38	1.95	190	2.95	570	....	....	....	....
21	1.10	40	1.10	40	2.15	245	2.55	370	....	....	....	....
22	....	48	....	40	2.45	335	2.45	335	....	....	....	....
23	1.25	57	1.10	40	2.50	350	2.45	335	....	....	....	....
24	1.20	50	1.10	40	2.30	290	2.50	350	....	....	....	....
25	1.15	45	1.18	48	2.10	230	2.35	305	....	....	....	....
26	1.20	50	1.20	50	1.95	190	2.45	335	....	....	....	....
27	1.25	57	....	48	1.85	170	2.40	320	....	....	....	....
28	1.25	57	1.15	45	1.85	170	2.30	290	....	....	....	....
29	1.30	65	....	....	1.85	170	2.45	335	....	....	....	....
30	1.25	57	....	....	1.90	180	2.28	285	....	....	....	....
31	1.25	57	....	....	1.95	190	....	....	....	....	....	....

Monthly Discharge of Six Mile River 5 Miles from Pemberton for 1915.

(Drainage area, 30 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January....................	80	40	61	2.03	2.34	3,750
February....................	53	35	43	1.43	1.49	2,390
March....................	350	47	147	4.90	5.65	9,040
April....................	910	215	394	13.13	14.65	23,400
The period.............	910	35	161	5.37	24.13	38,580

NOTE.—Discontinued April 30th, 1915.

Soo River.—(1037).

Location.—At the highway bridge, 2 miles from the mouth, 6½ miles from Pemberton, and 56 miles from Squamish.

Records Available.—Daily discharges from December 5, 1914, to April 30, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Seventy-five square miles (measured from the Provincial map of 1912, scale 3 miles to the inch).

Gauge.—Vertical staff gauge on bridge pier. The gauge readings are taken daily by C. E. Dobbie.

Channel.—Wide and shallow, strewn with boulders, gravel and silt. The current is fairly swift.

Discharge Measurements.—Seven meter measurements made in 1915 give a well defined rating curve.

Winter Flow.—The measuring section is usually frozen over and the channel is affected by ice during the winter.

Accuracy.—"B."

Discharge Measurements of Soo River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 26	C. E. Dobbie	1,057	79	355	0.52	1.30	60.7[1]
Feb. 4	Dobbie & Hughes	1,057	74	100	0.72	0.35	72.1
Mar. 20	C. E. Dobbie	1,057	85	230	1.80	1.18	425.0
Mar. 24	C. E. Dobbie	1,057	99	267	2.40	1.60	658.0
April 5	C. E. Dobbie	1,057	108	306	2.90	1.75	897.0
April 3	Cline & Dobbie	1,057	102	254	2.00	3.00	496.0[2]
May 25	C. G. Cline	1,505	100	253	3.20	3.60	803.0[2]

[1] Ice cover

[2] Subsidiary gauge.

Daily Gauge Height and Discharge of Soo River near Pemberton for 1915.

Drainage area, 75 square miles.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.30	130	....	75	2.20	75	2.95	465	....	....	....	....
2	....	100	2.60	75	2.20	75	....	1,050	....	....	....	....
3	2.20	75	2.20	75	2.20	75	5.00	1,630	....	....	....	....
4	2.20	75	2.20	75	....	87	....	1,260	....	....	....	....
5	2.20	75	....	68	2.25	100	3.75	905	....	....	....	....
6	....	75	2.15	50	2.28	120	3.50	765	....	....	....	....
7	2.20	75	2.15	50	2.30	130	3.50	765	....	....	....	....
8	....	75	2.15	50	2.30	130	....	670	....	....	....	....
9	2.20	75	2.15	50	....	130	....	580	....	....	....	....
10	2.20	75	2.15	50	2.30	130	3.00	490	....	....	....	....
11	....	75	2.15	50	....	130	3.30	650	....	....	....	....
12	....	75	....	50	2.30	130	3.75	905	....	....	....	....
13	2.20	75	2.15	50	2.30	130	3.80	930	....	....	....	....
14	2.20	75	2.15	50	....	230	3.40	710	....	....	....	....
15	....	190	2.15	50	....	330	3.40	710	....	....	....	....
16	2.45	205	2.15	50	2.90	440	3.40	710	....	....	....	....
17	2.20	75	2.18	65	....	455	3.80	930	....	....	....	....
18	2.20	75	2.15	50	....	470	3.90	990	....	....	....	....
19	....	75	....	37	3.00	490	4.00	1,045	....	....	....	....
20	2.20	75	2.10	25	2.83	398	3.90	990	....	....	....	....
21	....	75	2.18	65	3.05	512	3.40	710	....	....	....	....
22	....	75	....	70	....	680	3.30	650	....	....	....	....
23	3.60	75	2.20	75	3.65	850	3.20	600	....	....	....	....
24	4.00	75	2.20	75	3.32	660	3.30	650	....	....	....	....
25	4.50	75	2.23	90	2.95	465	3.10	545	....	....	....	....
26	4.80	75	2.20	75	2.95	405	3.23	615	....	....	....	....
27	5.00	75	....	75	2.75	257	....	570	....	....	....	....
28	5.30	75	2.20	75	2.75	257	3.08	525	....	....	....	....
29	5.00	75	....	....	2.75	257	....	505	....	....	....	....
30	....	75	....	....	2.84	400	3.00	490	....	....	....	....
31	3.30	75	....	....	2.83	398	....	....	....	....	....	....

NOTE.—January 23 to February 2 gauge raised because of ice.

Monthly Discharge of Soo River near Pemberton for 1915.

(Drainage area, 75 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January....................	205	75	85	1.13	1.30	5,230
February...................	90	25	61	0.81	0.84	3,390
March......................	850	75	303	4.04	4.66	18,600
April.......................	1,630	465	767	10.23	11.41	45,600
The period.............	1,630	25	304	4.05	18.21	72,820

NOTE.—Discontinued April 30th, 1915.

Texas Creek.—(1044).

Location.—At the highway bridge, 14 miles from Lillooet, on the west bank of the Fraser river.

Records Available.—Daily discharges from April to September, 1914, and from April to September, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Fifty square miles (measured from the Provincial map of 1912, scale 12 miles to the inch).

Gauge.—Vertical staff gauge nailed to the bridge pier. Gauge readings are taken three times a week by Mr. C. Armstrong, of Lillooet, B.C.

Channel.—Wide and shallow, and covered with boulders. The measuring section is rather poor but it is the best obtainable.

Discharge Measurements.—Four meter measurements taken during 1915 give a well defined rating curve.

Winter Flow.—Records kept only during the irrigation season.

Accuracy.—"C."

Discharge Measurements of Texas Creek 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 11	C. G. Cline	1,505	18	24.4	11.50	1.80	280.0
June 25	Hughes & Gordon	1,057	22	50.0	6.00	1.90	300.0
Aug. 10	H. C. Hughes	1,505	23	34.4	3.17	1.30	109.0
Dec. 5	H. C. Hughes	1,046	20	20.7	1.23	0.61	25.4

Daily Gauge Height and Discharge of Texas Creek at Highway Bridge, 14 Miles below Lillooet, for 1915.

Drainage area, 50 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	....	....	....	....	1.5	153	....	430
2	....	....	....	....	....	....	....	....	....	153	2.05	455
3	....	....	....	....	....	....	....	....	1.5	153	....	478
4	....	....	....	....	....	....	....	....	....	166	2.1	500
5	....	....	....	....	....	....	....	....	1.6	180	....	522
6	....	....	....	....	....	....	....	....	....	215	2.15	545
7	....	....	....	....	....	....	....	....	1.8	262	....	500
8	....	....	....	....	....	....	....	....	....	325	2.05	455
9	....	....	....	....	....	....	....	....	2.0	410	....	432
10	....	....	....	....	....	....	....	....	....	352	2.0	410
11	....	....	....	....	....	....	0.95	58	1.85	294	....	368
12	....	....	....	....	....	....	....	60	....	310	1.9	325
13	....	....	....	....	....	....	1.0	63	1.90	325	....	310
14	....	....	....	....	....	....	....	70	....	346	1.85	294
15	....	....	....	....	....	....	1.1	77	1.95	367	....	294
16	....	....	....	....	....	....	....	84	....	388	1.85	294
17	....	....	....	....	....	....	1.2	92	2.0	410	....	310
18	....	....	....	....	....	....	....	100	....	432	1.9	325
19	....	....	....	....	....	....	1.3	108	2.05	455	....	310
20	....	....	....	....	....	....	....	118	....	478	1.85	294
21	....	....	....	....	....	....	1.4	128	2.1	500	....	310
22	....	....	....	....	....	....	....	140	....	478	1.90	325
23	....	....	....	....	....	....	1.5	153	2.05	455	....	325
24	....	....	....	....	....	....	....	160	....	432	1.90	325
25	....	....	....	....	....	....	1.55	166	2.0	410	....	325
26	....	....	....	....	....	....	....	169	....	410	1.90	325
27	....	....	....	....	....	....	1.57	172	2.0	410	....	325
28	....	....	....	....	....	....	....	162	....	410	1.90	325
29	....	....	....	....	....	....	1.5	153	2.0	410	....	325
30	....	....	....	....	....	....	....	153	....	410	1.90	325
31	....	....	....	....	....	....	....	....	2.0	410	....	....

	July.		August.		September.		October.		November.		December.	
1	....	410	1.60	180	....	70	....	....	....	....	....	....
2	2.00	410	....	180	1.0	63	....	....	....	....	....	....
3	....	410	1.60	180	....	63	....	....	....	....	....	....
4	2.00	410	....	180	1.0	63	....	....	....	....	....	....
5	....	410	1.60	180	....	63	....	....	....	....	....	....
6	2.00	410	....	180	1.0	63	....	....	....	....	....	....
7	....	410	1.60	180	....	63	....	....	....	....	....	....
8	2.00	410	....	166	1.0	63	....	....	....	....	....	....
9	....	410	1.50	153	....	58	....	....	....	....	....	....
10	2.00	410	....	140	0.9	53	....	....	....	....	....	....
11	....	367	1.40	128	....	53	....	....	....	....	....	....
12	1.90	325	....	119	0.9	53	....	....	....	....	....	....
13	....	294	1.30	108	....	53	....	....	....	....	....	....
14	1.80	262	....	108	0.9	53	....	....	....	....	....	....
15	....	238	1.30	108	....	48	....	....	....	....	....	....
16	1.70	215	....	119	0.8	43	....	....	....	....	....	....
17	....	197	1.40	128	....	43	....	....	....	....	....	....
18	1.60	180	....	134	0.8	43	....	....	....	....	....	....
19	....	197	1.45	140	....	43	....	....	....	....	....	....
20	1.70	215	....	134	0.8	43	....	....	....	....	....	....
21	....	215	1.40	128	....	43	....	....	....	....	....	....
22	1.70	215	....	119	0.8	43	....	....	....	....	....	....
23	....	215	1.30	108	....	46	....	....	....	....	....	....
24	1.70	215	....	108	0.85	48	....	....	....	....	....	....
25	....	197	1.30	108	....	48	....	....	....	....	....	....
26	1.60	180	....	100	0.85	48	....	....	....	....	....	....
27	....	180	1.20	92	....	48	....	....	....	....	....	....
28	1.60	180	....	84	0.85	48	....	....	....	....	....	....
29	....	180	1.1	77	....	48	....	....	....	....	....	....
30	1.60	180	....	77	0.85	48	....	....	....	....	....	....
31	....	180	1.1	77	....	....	....	....	....	....	....	....

Monthly Discharge of Texas Creek ½ Mile above Mouth, 14 Miles below Lillooet, for 1915.

(Drainage area, 50 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	500	153	352.0	7.04	8.12	21,600
June	545	294	370.0	7.40	8.26	22,000
July	410	180	281.0	5.62	6.48	17,300
August	180	77	130.0	2.60	3.00	7,990
September	70	43	52.1	1.04	1.16	3,160
The period	545	43	237.0	4.74	27.02	72,050

NOTE.—Station maintained only during irrigation season, May to September, 1915.

VANCOUVER ISLAND DISTRICT.

BIG QUALICUM RIVER.—(1032).

Location.—One thousand feet upstream from Esquimalt and Nanaimo Railway bridge. Twenty miles from Parksville.

Records Available.—Daily discharges, March 23, 1913, to April 30, 1914, May 21, 1914, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Sixty-two square miles.

Gauge.—Eighteen foot wooden staff, location on left bank about one hundred feet above railroad bridge; read daily by Mr. Leon Becque.

Channel.—Even gravel bed. Channel straight for 300 feet above and below section.

Discharge Measurements.—One in 1913 by Provincial Water Rights Branch, four in 1914 and three in 1915. Covering all but highest stage.

Winter Flow.—Open all year.

Accuracy.—"B" (up to discharge of 450 cubic feet per second), "C" (above 450 cubic feet per second).

Co-operation.—Gauge installed in 1913 by Provincial Water Rights Branch, and records to April 30, 1914, supplied by that branch.

Discharge Measurements of Big Qualicum River at 1½ Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 15	Milner & Webb	1,057	64	96.2	3.26	2.65	314.0
Sept. 4	H. C. Hughes	1,505	28	17.4	1.39	1.27	24.3[1]
Nov. 1	Webb & Balls	1,057	68	148.0	5.26	3.55	778.0

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[1] Not at regular section.

Daily Gauge Height and Discharge of Big Qualicum River 1½ Mile above Mouth for 1915.

(Drainage area, 62 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.2	140	2.3	170	2.4	200	2.6	280	2.1	120	2.0	100
2	2.6	280	2.3	170	2.4	200	3.2	560	2.1	120	2.0	100
3	2.9	410	2.2	140	2.4	200	3.4	680	2.1	120	1.9	85
4	2.8	360	2.2	140	2.4	200	3.2	560	2.1	120	1.9	85
5	2.8	360	2.2	140	2.4	200	3.1	510	2.0	100	1.9	85
6	2.7	320	2.4	200	2.4	200	3.0	460	2.0	100	1.9	85
7	2.7	320	2.6	280	2.4	200	3.0	460	2.0	100	1.8	70
8	2.8	360	2.7	320	2.4	200	2.9	410	2.0	100	1.8	70
9	2.8	360	2.7	320	2.3	170	2.8	360	2.0	100	1.8	70
10	2.9	410	2.7	320	2.3	170	2.8	360	2.1	120	1.8	70
11	3.6	810	2.6	280	2.3	170	2.7	320	2.1	120	1.8	70
12	3.3	620	2.6	280	2.3	170	2.7	320	2.1	120	1.7	70
13	3.1	510	2.7	320	2.3	170	2.7	320	2.1	120	1.7	55
14	3.2	560	2.7	320	2.3	170	2.7	320	2.1	120	1.7	55
15	3.0	460	2.7	320	2.8	360	2.7	320	2.1	120	1.7	55
16	2.9	410	2.7	320	2.8	360	2.6	280	2.1	120	1.7	55
17	2.8	360	2.9	410	3.0	460	2.6	280	2.0	100	1.7	55
18	2.7	320	2.8	360	3.0	460	2.5	240	2.0	100	1.7	55
19	2.7	320	2.6	280	3.0	460	2.5	240	2.0	100	1.7	55
20	2.6	280	2.5	240	2.9	410	2.4	200	2.0	100	1.6	45
21	2.5	240	2.5	240	2.9	410	2.4	200	2.0	100	1.6	45
22	2.4	200	2.5	240	2.8	350	2.4	200	2.0	100	1.6	45
23	2.4	200	2.5	240	2.8	360	2.3	170	2.0	100	1.6	45
24	2.3	170	2.5	240	2.7	320	2.3	170	2.0	100	1.6	45
25	2.3	170	2.5	240	2.6	280	2.3	170	2.0	100	1.6	45
26	2.3	170	2.5	240	2.6	280	2.2	140	2.0	100	1.6	45
27	2.3	170	2.5	240	2.5	240	2.2	140	2.0	100	1.5	35
28	2.2	140	2.4	200	2.5	240	2.2	140	2.0	100	1.5	35
29	2.2	140	2.0	....	2.5	240	2.1	120	2.0	100	1.5	35
30	2.2	140	....	....	2.5	240	2.1	120	2.0	100	1.5	35
31	2.2	140	....	....	2.5	240	....	....	2.0	100	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	1.5	35	1.4	25	1.3	20	1.3	20	3.6	810	2.9	410
2	1.5	35	1.4	25	1.3	20	1.4	25	3.5	740	2.9	410
3	1.5	35	1.4	25	1.3	20	1.4	25	3.3	620	3.0	460
4	1.5	35	1.4	25	1.3	20	1.4	25	3.1	510	3.0	460
5	1.5	35	1.4	25	1.3	20	1.4	25	3.0	460	3.0	460
6	1.5	35	1.4	25	1.3	20	1.4	25	2.9	410	3.4	680
7	1.5	35	1.4	25	1.3	20	1.4	25	2.8	360	3.3	620
8	1.5	35	1.3	20	1.3	20	1.4	25	2.7	320	3.8	960
9	1.5	35	1.3	20	1.3	20	1.4	25	2.6	280	3.6	810
10	1.5	35	1.3	20	1.3	20	1.4	25	2.5	240	3.4	680
11	1.5	35	1.3	20	1.3	20	1.4	25	2.5	240	3.2	560
12	1.5	35	1.3	29	1.3	20	1.4	25	2.4	200	3.2	560
13	1.5	35	1.3	20	1.3	20	1.4	25	2.3	170	3.2	560
14	1.5	35	1.3	20	1.3	20	1.4	25	2.3	170	3.0	460
15	1.5	35	1.3	20	1.3	20	1.4	25	2.4	200	2.9	410
16	1.4	25	1.3	20	1.3	20	1.4	25	2.4	200	2.9	410
17	1.4	25	1.3	20	1.3	20	1.4	25	2.8	360	2.8	360
18	1.4	25	1.3	20	1.3	20	1.7	55	2.7	320	2.8	360
19	1.4	25	1.3	20	1.3	20	1.7	55	2.7	320	2.8	360
20	1.4	25	1.3	20	1.3	20	2.0	100	2.6	280	3.3	620
21	1.4	25	1.3	20	1.3	20	2.7	320	2.6	280	3.9	1,040
22	1.4	25	1.3	20	1.3	20	2.7	320	2.6	280	3.7	880
23	1.4	25	1.3	20	1.3	20	2.8	360	2.9	410	3.5	740
24	1.4	25	1.3	20	1.3	20	2.8	360	2.8	360	3.4	680
25	1.4	25	1.3	20	1.3	20	2.8	360	3.2	560	3.3	620
26	1.4	25	1.3	20	1.3	20	2.8	360	3.3	620	3.2	560
27	1.4	25	1.3	20	1.3	20	3.6	810	3.1	510	3.1	510
28	1.4	25	1.3	20	1.3	20	4.2	1,300	3.0	460	3.0	460
29	1.4	25	1.3	20	1.3	20	3.9	1,040	3.1	510	2.9	410
30	1.4	25	1.3	20	1.3	20	3.7	880	3.0	460	2.8	360
31	1.4	25	1.3	20	....	....	3.8	960	....	....	2.7	320

Monthly Discharge of Big Qualicum River 1½ Mile above Mouth for 1915.

(Drainage area, 62 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	810	140	318.0	5.13	5.91	19,600
February	410	140	257.0	4.15	4.32	14,300
March	460	170	269.0	4.34	5.00	16,500
April	680	120	302.0	4.87	5.43	18,000
May	120	100	107.0	1.73	1.99	6,580
June	100	35	60.0	0.97	1.08	3,570
July	35	25	29.8	0.48	0.55	1,830
August	25	20	21.1	0.34	0.39	1,300
September	20	20	20.0	0.32	0.36	1,190
October	1,300	20	248.0	4.00	4.61	15,200
November	810	170	389.0	6.27	7.00	23,100
December	1,040	320	554.0	8.93	10.29	34,100
The year	1,300	20	215.0	3.46	46.93	155,270

CAMPBELL RIVER.—(1042).

Location.—At outlet from Campbell lake.

Records Available.—Daily discharges, May 10, 1910, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Seven hundred and eighty square miles.

Gauge.—Twelve-foot enamel staff in sections, located one thousand feet above measuring section. Read twice daily by James Forbes.

Channel.—Gravel and boulder bed. Channel straight for 200 feet above section. Rapids 100 feet below section.

Discharge Measurements.—Four in 1914, six in 1915, covering all stages.

Winter Flow.—Open all year.

Accuracy.—"B" (up to discharge of 4,000 cubic feet per second). "C" (above 4,000 cubic feet per second).

Co-operation.—Gauge records previous to June 2, 1914, supplied by Campbell River Power Company. A cable car was also established in conjunction with this power company.

Discharge Measurements of Campbell River at Campbell Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 16	H. C. Hughes	1,933	165	820	4.31	3.74	3,524
Aug. 6	C. G. Cline	1,046	107	490	2.60	1.60	1,260
Oct. 9	H. C. Hughes	1,505	97	455	1.84	1.15	836
Oct. 11	H. C. Hughes	1,505	97	425	1.68	1.01	716
Oct. 26	Webb & Balls	1,057	170	1,267	6.46	6.45	8,180
Oct. 27	Webb & Balls	1,057	171	1,520	7.57	8.10	11,500

Gauge lowered 1.0.
New section for 1915 measurements.

Daily Gauge Height and Discharge of Campbell River at Lake for 1915.

(Drainage area, 780 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.57	1,190	1.25	930	2.07	1,620	3.37	3,040	2.60	2,160	3.10	2,720
2	1.87	1,430	1.42	1,070	2.05	1,600	4.15	4,140	2.47	2,020	2.95	2,550
3	2.02	1,570	1.50	1,130	2.00	1,550	5.70	6,760	2.45	2,000	2.87	2,460
4	2.22	1,770	1.57	1,190	2.00	1,550	6.47	8,240	2.55	2,100	2.80	2,380
5	2.32	1,870	1.67	1,270	2.00	1,550	6.45	8,200	2.75	2,330	2.82	2,400
6	2.32	1,870	1.77	1,350	2.00	1,550	6.00	7,300	2.97	2,570	3.00	2,600
7	2.27	1,820	1.90	1,450	1.97	1,520	6.65	8,600	3.42	3,100	3.27	2,920
8	2.27	1,820	2.12	1,670	1.92	1,470	5.20	5,860	3.85	3,690	3.52	3,230
9	2.30	1,850	2.37	1,920	1.87	1,430	4.80	5,180	4.10	4,060	3.60	3,340
10	2.32	1,870	2.52	2,070	1.80	1,370	4.47	4,650	4.20	4,220	3.52	3,230
11	2.57	2,130	2.60	2,160	1.72	1,310	4.15	4,140	4.20	4,220	3.35	3,020
12	2.95	2,550	2.60	2,160	1.70	1,290	3.90	3,760	4.20	4,220	3.17	2,800
13	3.10	2,720	2.52	2,070	1.63	1,230	3.90	3,760	4.10	4,060	3.10	2,720
14	3.07	2,680	2.42	1,970	1.62	1,220	3.82	3,650	4.00	3,900	3.10	2,720
15	2.92	2,510	2.40	1,950	1.90	1,450	3.72	3,510	3.93	3,800	3.10	2,720
16	2.77	2,350	2.35	1,900	2.42	1,970	3.62	3,370	3.75	3,550	3.10	2,720
17	2.52	2,070	2.30	1,850	3.10	2,720	3.60	3,340	3.50	3,200	3.10	2,720
18	2.40	1,950	2.27	1,820	4.55	4,780	3.67	3,440	3.35	3,020	3.10	2,720
19	2.20	1,750	2.22	1,770	5.67	6,710	3.77	3,580	3.37	3,040	3.07	2,680
20	2.00	1,550	2.12	1,670	6.08	7,460	3.90	3,760	3.45	3,140	3.02	2,620
21	1.87	1,430	2.02	1,570	5.72	6,800	3.90	3,760	3.53	3,240	2.92	2,510
22	1.75	1,330	2.00	1,550	5.55	6,490	3.90	3,760	3.55	3,270	2.82	2,400
23	1.67	1,270	1.95	1,500	5.55	6,490	3.80	3,620	3.50	3,200	2.73	2,300
24	1.57	1,190	1.97	1,520	5.45	6,310	3.55	3,270	3.42	3,100	2.63	2,190
25	1.47	1,110	2.02	1,570	5.22	5,900	3.37	3,040	3.32	2,980	2.60	2.160
26	1.40	1,050	2.10	1,650	4.87	5,300	3.25	2,900	3.30	2,960	2.60	2,160
27	1.32	990	2.10	1,650	4.40	4,540	3.12	2,740	3.25	2,900	2.52	2,070
28	1.25	930	2.10	1,650	3.92	3.790	3.02	2,620	3.27	2,920	2.43	1,980
29	1.20	890	....	....	3.67	3,440	2.87	2,460	3.30	2,960	2.33	1,880
30	1.15	850	....	....	3.55	3,270	2.77	2,350	3.30	2,960	2.25	1,800
31	1.15	850	....	....	3.37	3,040	....	....	3.25	2,900	....	....

	July.		August.		September.		October.		November.		December.	
1	2.25	1,800	1.70	1,290	1.30	970	0.60	450	9.10	13,700	3.0	2,600
2	2.37	1,920	1.65	1,250	1.25	930	0.70	510	8.42	12.200	3.0	2,600
3	2.47	2,020	1.67	1,270	1.25	930	0.95	690	7.47	10,200	3.1	2,720
4	2.55	2,100	1.70	1,290	1.20	890	1.15	850	6.55	8,400	3.5	3,200
5	2.68	2,250	1.65	1,250	1.15	850	1.27	950	5.75	6,850	4.2	4.220
6	2.77	2,350	1.60	1,210	1.10	810	1.30	970	5.05	5,590	4.7	5,020
7	2.78	2,360	1.60	1,210	1.05	770	1.30	970	4.50	4,700	4.95	5,420
8	2.70	2,270	1.55	1,170	1.05	770	1.22	910	4.02	3,930	4.87	5,290
9	2.62	2,180	1.47	1,110	1.02	750	1.15	850	3.60	3.340	4.52	4,730
10	2.52	2,070	1.45	1,090	1.00	730	1.07	790	3.25	2,900	4.22	4,250
11	2.43	1,980	1.40	1,050	1.00	730	1.00	730	3.02	2,620	4.02	3,930
12	2.32	1,870	1.37	1,030	0.95	690	1.00	730	2.82	2.400	3.75	3,550
13	2.28	1.830	1.32	990	0.95	690	1,05	770	2.60	2,160	3.77	3,580
14	2.18	1,730	1.30	970	0.92	670	1.17	870	2.50	2,050	3.65	3,410
15	2.07	1,620	1.30	970	0.90	650	1.30	970	2.42	1,970	3.37	3,040
16	2.05	1,600	1.25	930	0.87	630	1.40	1,050	2.32	1,870	3.15	2,780
17	2.00	1,550	1.25	930	0.85	610	1.40	1,050	2.30	1,850	2.87	2,460
18	1.95	1,500	1.25	930	0.82	590	1.40	1,050	2.37	1,920	2.65	2,210
19	1.90	1,450	1.25	930	0.80	570	1.42	1,070	2.52	2,070	2.55	2,100
20	1.90	1,450	1.25	930	0.75	540	1.70	1,290	2.60	2,160	2.82	2,400
21	1.85	1,410	1.25	930	0.75	540	3.12	2,740	2.55	2,100	3.40	3,080
22	1.85	1,410	1.30	970	0.70	510	5.50	6,400	2.52	2,070	3.62	3,370
23	1.85	1,410	1.30	970	0.70	510	6.42	8,140	2.67	2,240	3.67	3,440
24	1.82	1,390	1.30	970	0.70	510	6.42	8,140	2.72	2,290	3.82	3,650
25	1.80	1,370	1.30	970	0.65	480	6.12	7,540	2.95	2,540	3.82	3,650
26	1.75	1,330	1.30	970	0.65	480	6.30	7,900	3.12	2,740	3.65	3,410
27	1.75	1,330	1.30	970	0.60	450	8.27	11,800	3.20	2,840	3.32	2,980
28	1.75	1,330	1.25	930	0.60	450	10.42	16,700	3.20	2,840	3.02	2,620
29	1.75	1,330	1.25	930	0.60	450	11.50	19,200	3.17	2,800	2.85	2,430
30	1.72	1,310	1.25	930	0.60	450	10.72	17,400	3.12	2,740	2.60	2,160
31	1.70	1,290	1.25	930	....		9.62	14,800			2.35	1,900

Monthly Discharge of Campbell River near Lake for 1915.

(Drainage area, 780 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	2,720	850	1,650	2.11	2.43	101,000
February	2,160	930	1,650	2.11	2.20	91,600
March	7,460	1,220	3,250	4.17	4.81	200,000
April	8,600	2,350	4,290	5.50	6.14	255,000
May	4,220	2,000	3,150	4.04	4.66	194,000
June	3,340	1,800	2,560	3.28	3.66	152,000
July	2,360	1,290	1,700	2.18	2.51	105,000
August	1,290	930	1,040	1.33	1.53	64,000
September	970	450	650	0.83	0.93	38,700
October	19,200	450	4,460	5.72	6.59	274,000
November	13,700	1,850	3,940	5.05	5.63	234,000
December	5,420	1,900	3,300	4.23	4.88	203,000
The year	19,200	450	2,640	3.38	45.97	1,912,300

CHEMAINUS RIVER.—(1027).

Location.—Upstream side of Esquimalt and Nanaimo Railway bridge, 5 miles from Chemainus—low water measurements made by wading.

Records Available.—Daily discharges May 13, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—One hundred and twenty square miles.

Gauge.—Eighteen-foot wooden staff, located on left bank, 100 feet below bridge. Read daily by Mr. R. C. Mainguy.

Channel.—Straight for 150 feet above and 300 feet below section. Gravel and sand bed.

Discharge Measurements.—Six in 1914, three in 1915, covering all but highest stage.

Winter Flow.—Open all year.

Accuracy.—"A" (up to discharge of 600 cubic feet per second). "C" (above 600 cubic feet per second).

Discharge Measurements of Chemainus River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 24	Cline & Webb	1,933	110	531	1.80	4.15	935.0
Aug. 31	H. C. Hughes	1,505	34	16	0.67	1.93	10.8[1]
Dec. 10	C. E. Webb	1,056	123	665	2.50	5.17	1,650.0

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[1] Not at regular station.

Daily Gauge Height and Discharge of Chemainus River 1 Mile above Mouth for 1915.

(Drainage area, 120 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.96	640	3.70	480	....	550	5.70	2,520	....	250	3.20	260
2	4.53	1,110	4.10	740	3.75	510	8.05	5,580	3.15	240	3.15	240
3	4.40	980	3.80	540	3.55	410	6.00	2,900	3.15	240	3.07	210
4	4.21	830	3.70	480	3.75	510	....	2,000	3.10	220	3.08	210
5	4.10	740	3.82	550	3.78	530	4.55	1,130	3.00	190	3.05	200
6	3.80	540	4.80	1,400	3.85	570	4.35	940	3.08	210	3.00	190
7	3.93	620	4.80	1,400	....	550	4.34	930	3.08	210	3.00	190
8	5.80	2,640	4.60	1,180	3.78	530	....	910	....	230	2.95	180
9	5.55	2,320	4.59	1,170	3.69	470	4.30	900	3.18	250	2.93	170
10	5.85	2,710	4.40	980	3.49	380	4.28	880	3.20	260	2.90	160
11	6.67	3,760	4.20	820	3.45	360	4.16	790	3.25	280	2.87	150
12	5.60	2,380	4.09	730	3.42	350	4.10	740	3.25	280	2.83	150
13	4.90	1,520	4.00	660	3.43	350	4.18	800	3.25	280	2.80	140
14	4.35	940	3.90	600	3.77	520	4.11	750	3.20	260	2.80	140
15	4.19	810	3.78	530	6.62	3,700	3.93	620	3.10	220	2.75	130
16	4.00	660	3.65	460	5.15	1.820	3.86	580	3.05	200	2.75	130
17	3.90	600	4.10	740	5.37	2,080	3.84	560	3.05	210	....	130
18	3.80	540	4.14	770	5.00	1,640	3.78	530	3.00	190	2.75	130
19	3.72	490	4.00	660	4.30	900	3.74	500	3.00	190	2.75	130
20	3.60	430	3.81	550	4.30	900	3.70	480	3.00	190	2.80	140
21	3.55	410	3.70	480	4.42	1,000	3.60	430	3.10	220	2.78	140
22	3.45	360	3.65	450	4.55	1,130	3.60	430	3.22	270	2.75	130
23	3.35	320	3.65	460	4.55	1,130	3.40	340	3.25	280	2.70	120
24	3.25	280	3.76	520	3.90	600	3.30	300	3.28	290	2.65	110
25	3.22	270	4.28	880	4.45	1,030	3.20	260	3.29	290	2.64	110
26	3.20	260	3.87	580	3.82	550	3.15	240	3.32	310	2.60	100
27	3.19	260	3.80	540	3.70	480	3.10	220	3.34	320	2.55	90
28	3.16	240	3.90	600	3.63	450	3.00	190	3.34	320	2.54	90
29	3.15	240	....	....	3.63	440	3.20	260	3.36	320	2.50	80
30	3.14	240	....	....	4.16	790	3.20	260	3.38	330	2.48	80
31	3.14	240	....	....	4.18	800	....	....	3.30	300	....	....

	July.		August.		September.		October.		November.		December.	
1	2.46	72	2.32	44	1.94	12	2.03	16	5.70	2,520	4.45	1,030
2	2.41	62	2.32	44	1.93	12	2.03	16	4.78	1,380	3.85	570
3	2.38	56	2.30	40	1.92	11	2.40	60	4.34	930	5.20	1,880
4	2.38	56	2.26	36	1.92	11	2.29	39	4.08	720	5.60	2,380
5	2.38	56	2.24	34	1.92	11	2.10	20	4.00	660	5.90	2,760
6	2.38	56	2.22	32	1.95	12	2.18	28	3.77	520	6.46	3,480
7	2.40	60	2.20	30	1.95	13	2.18	28	3.62	440	5.70	2,520
8	2.41	62	2.20	30	2.00	15	2.18	28	3.58	420	8.45	6,130
9	2.43	66	2.20	30	2.04	17	2.18	28	3.44	360	6.00	2,900
10	2.45	70	2.18	28	1.98	14	....	24	3.35	320	5.40	2,120
11	2.45	70	2.16	26	2.00	15	2.10	20	3.27	290	5.00	1,640
12	2.45	70	2.13	23	1.98	14	2.00	15	3.30	300	4.91	1,530
13	2.43	66	2.10	20	2.00	15	2.05	17	3.20	260	4.90	1,520
14	2.43	66	2.10	20	2.03	16	2.04	17	3.27	290	4.52	1,100
15	2.42	64	2.10	20	2.03	17	2.29	39	3.07	210	4.51	1,090
16	2.42	64	2.10	20	2.03	16	2.35	50	3.80	540	4.35	940
17	2.41	62	2.10	20	2.00	15	2.31	42	4.27	880	4.20	820
18	2.41	62	2.10	20	2.00	15	2.28	38	4.55	1,130	4.11	750
19	2.39	58	2.10	20	2.00	15	2.45	70	5.04	1,690	4.25	860
20	2.38	56	2.07	18	2.03	16	3.20	260	3.40	340	6.00	2,900
21	2.38	56	2.07	18	2.04	17	4.00	660	4.21	830	6.81	3,950
22	2.34	48	2.07	18	2.04	17	3.85	570	3.40	340	6.31	3,290
23	2.30	40	2.07	18	2.07	18	3.70	480	5.08	1,740	5.22	1,900
24	2.30	40	2.07	18	2.09	20	4.40	980	5.08	1,740	4.89	1,510
25	2.35	50	2.07	18	2.02	16	5.10	1,760	4.90	1,520	4.30	900
26	2.34	48	2.04	17	2.02	16	6.40	3,400	5.90	2,760	4.37	960
27	2.34	48	2.04	17	2.02	16	5.67	2,480	4.45	1,030	4.20	820
28	2.34	48	2.04	17	2.02	16	6.55	3,610	4.11	750	4.20	820
29	2.35	50	2.04	17	2.02	16	....	2,970	4.40	980	4.10	740
30	2.35	50	....	16	2.02	16	5.57	2,340	4.43	1,010	4.00	660
31	2.35	50	2.00	15	....	....	7.25	4,520	....	....	4.99	1,630

Monthly Discharge of Chemainus River 1 Mile above Mouth for 1915.

(Drainage area, 120 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	3,760	240	916	7.63	8.80	56,300
February	1,400	450	713	5.94	6.18	39,600
March	3,700	350	840	7.00	8.07	51,600
April	5,580	190	932	7.76	8.66	55,500
May	330	190	253	2.11	2.43	15,600
June	260	80	148	1.23	1.37	8,810
July	72	40	58	0.48	0.55	3,540
August	44	15	24	0.20	0.23	1,480
September	20	11	15	0.13	0.14	893
October	4,520	15	795	6.63	7.64	48,900
November	2,760	210	897	7.47	8.33	53,400
December	6,130	570	1,810	15.10	17.40	111,000
The year	6,130	11	617	5.14	69.80	446,623

COWICHAN RIVER.—(1054).

Location.—Near outlet from Cowichan lake, 500 feet below Canadian Northern Pacific Railway bridge, except for low water.

Records Available.—Daily discharges January 31, 1913, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Two hundred and thirty-five square miles.

Gauge.—Twelve foot wooden staff at highway bridge at outlet from lake, near left bank. Gauge read twice daily by Mr. C. E. Sherwood and Mr. H. T Hardinge.

Channel.—Gravel and small boulder bed. Channel straight for 200 feet above and below section.

Discharge Measurements.—Five in 1913, by Provincial Water Rights Branch, four in 1914 and four in 1915, covering all stages.

Winter Flow.—Open all year.

Accuracy.—"B"—*Note:*—The accuracy of 1914 discharges is not good owing to errors in gauge records.

Co-operation.—Provincial Water Rights Branch established station in 1913.

Discharge Measurements of Cowichan River at Cowichan Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 23	Cline & Webb	1,933	191	1,310	1.60	4.68	2,080
Aug. 30	H. C. Hughes	1,505	110	150	0.72	0.61	108[1]
Dec. 9	C. E. Webb	1,056	199	1,780	2.71	7.54	4,820
Dec. 9	C. E. Webb	1,056	199	1,830	2.72	7.71	4,990

[1] Not at regular section.

Daily Gauge Height and Discharge of Cowichan River near Cowichan Lake for 1915.

(Drainage area, 235 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.30	1,280	3.40	1,340	4.00	1,740	4.50	2,120	3.10	1,160	2.16	655
2	3.50	1,400	3.50	1,400	4.00	1,740	5.20	2,700	3.00	1,100	2.14	645
3	3.80	1,600	3.60	1,460	3.90	1,670	5.80	3,220	2.90	1,045	2.12	635
4	3.80	1,600	3.60	1,460	3.90	1,670	5.85	3,260	2.85	1,020	2.10	625
5	3.80	1,600	3.70	1,530	3.90	1,670	5.80	3,220	2.80	990	2.08	615
6	3.90	1,670	3.80	1,600	3.80	1,600	5.70	3,130	2.75	960	2.06	605
7	4.00	1,740	4.00	1,740	3.80	1,600	5.70	3,130	2.70	935	2.04	595
8	4.10	1,810	4.10	1,810	3.80	1,600	5.60	3,050	2.65	910	2.02	585
9	4.40	2,040	4.10	1,810	3.70	1,530	5.50	2,960	2.60	880	2.00	575
10	4.70	2,280	4.10	1,810	3.70	1,530	5.40	2,870	2.60	880	1.98	565
11	5.00	2,540	4.20	1,880	3.60	1,460	5.40	2,870	2.60	880	1.96	555
12	5.30	2,790	4.20	1,880	3.60	1,460	5.30	2,790	2.60	880	1.94	545
13	5.30	2,790	4.20	1,880	3.50	1,400	5.30	2,790	2.60	880	1.92	535
14	5.20	2,700	4.00	1,740	3.50	1,400	5.20	2,700	2.60	880	1.90	525
15	5.10	2,620	4.20	1,880	3.80	1,600	5.10	2,620	2.60	880	1.88	515
16	5.00	2,540	4.20	1,880	4.30	1,960	4.90	2,450	2.60	880	1.86	505
17	4.90	2,450	4.10	1,810	4.60	2,200	4.80	2,360	2.50	825	1.84	495
18	4.80	2,360	4.10	1,810	4.70	2,280	4.70	2,280	2.40	775	1.82	485
19	4.60	2,200	4.00	1,740	4.80	2,360	4.55	2,160	2.40	775	1.80	475
20	4.50	2,120	4.00	1,740	4.80	2,360	4.35	2,000	2.35	750	1.78	465
21	4.40	2,040	....	1,740	4.80	2,360	4.20	1,880	2.35	750	1.76	455
22	4.20	1,880	4.00	1,740	4.70	2,280	4.10	1,810	2.35	750	1.73	445
23	4.10	1,810	4.00	1,740	4.70	2,280	4.00	1,740	2.30	725	1.70	430
24	4.00	1,740	4.00	1,740	4.70	2,280	3.90	1,670	2.30	725	1.62	400
25	3.90	1,670	4.00	1,740	4.60	2,200	3.80	1,600	2.30	725	1.55	370
26	3.80	1,600	4.00	1,740	4.50	2,120	3.70	1,530	2.28	715	1.53	360
27	3.60	1,460	4.00	1,740	4.40	2,040	3.55	1,430	2.26	705	1.50	350
28	3.70	1,530	4.00	1,740	4.30	1,960	3.40	1,340	2.24	695	1.48	345
29	3.50	1,400	....	....	4.20	1,880	3.30	1,280	2.22	685	1.44	330
30	3.40	1,340	....	....	4.10	1,810	3.20	1,220	2.20	675	1.40	320
31	3.30	1,280	....	....	4.10	1,810	....	....	2.18	665	....	....

	July.		August.		September.		October.		November.		December.	
1	1.35	305	0.87	167	0.57	93	0.28	32	6.36	3,720	5.47	2,930
2	1.34	300	0.86	165	9.56	90	0.37	45	6.45	3,800	5.47	2,930
3	1.33	300	0.85	162	0.55	87	0.45	62	6.31	3,680	5.65	3,090
4	1.32	295	0.84	160	0.54	85	0.49	73	6.20	3,580	6.05	3,440
5	1.31	295	0.83	157	0.53	83	0.50	75	5.90	3,310	6.33	3,700
6	1.30	290	0.82	155	0.52	80	0.50	75	5.75	3,170	6.73	4,060
7	1.29	290	0.81	152	0.51	77	0.50	75	5.55	3,000	6.90	4,210
8	1.28	285	0.81	152	0.48	70	0.47	68	5.45	2,910	7.53	4,830
9	1.26	280	0.80	150	0.46	65	0.45	62	5.16	2,670	7.68	4,980
10	1.24	270	0.79	147	0.44	60	0.43	57	4.97	2,510	7.58	4,880
11	1.22	265	0.78	145	0.42	55	0.40	50	4.79	2,350	7.43	4,730
12	1.20	260	0.77	143	0.40	50	0.45	62	4.59	2,190	7.34	4,640
13	1.18	255	0.76	140	0.39	48	0.48	70	4.53	2,140	7.15	4,450
14	1.16	250	0.75	137	0.38	47	0.50	75	4.42	2,060	6.95	4,250
15	1.14	240	0.74	135	0.37	45	0.50	75	4.36	2,010	6.70	4,030
16	1.12	235	0.73	133	0.36	44	0.55	87	4.33	1,980	6.60	3,940
17	1.10	230	0.72	130	0.35	42	0.55	87	4.51	2,130	6.28	3,650
18	1.08	225	0.71	127	0.35	42	0.60	100	4.61	2,210	6.08	3,470
19	1.04	210	0.70	125	0.35	42	0.60	100	4.64	2,230	5.90	3,310
20	1.00	200	0.69	122	0.35	42	1.00	200	4.65	2,240	6.25	3,620
21	0.98	195	0.69	120	0.35	42	1.50	350	4.67	2,260	6.74	4,070
22	0.96	190	0.67	117	0.34	41	1.80	475	4.71	2,290	7.25	4,550
23	0.95	185	0.66	115	0.33	39	2.10	625	4.87	2,420	7.33	4,630
24	0.94	185	0.65	113	0.32	38	2.30	725	4.94	2,490	7.18	4,480
25	0.93	180	0.64	110	0.31	36	2.63	895	5.09	2,610	7.03	4,330
26	0.92	180	0.63	107	0.30	35	3.02	1,110	5.53	2,990	6.80	4,120
27	0.91	177	0.62	105	0.29	33	4.03	1,760	5.59	3,040	6.70	4,030
28	0.90	175	0.61	103	0.29	33	5.14	2,650	5.51	2,970	6.45	3,800
29	0.89	172	0.60	100	0.29	33	5.20	2,700	5.59	3,040	6.27	3,640
30	0.88	170	0.59	97	0.28	32	5.35	2,830	5.52	2,980	6.04	3,440
31	0.88	170	0.58	95	....	....	6.05	3,440	....	....	5.80	3,220

Monthly Discharge of Cowichan River near Cowichan Lake for 1915.

(Drainage area, 235 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	2,790	1,280	1,930	8.21	9.46	119,000
February	1,880	1,340	1,720	7.32	7.62	95,500
March	2,360	1,400	1,870	7.96	9.18	115,000
April	3,260	1,220	2,340	9.96	11.11	139,000
May	1,160	665	842	3.58	4.13	51,800
June	655	320	500	2.13	2.38	29,800
July	305	170	234	1.00	1.15	14,400
August	167	95	132	0.56	0.63	8,120
September	93	32	54	0.23	0.26	3,190
October	3,440	32	616	2.62	3.02	37,900
November	3,800	1,980	2,700	11.50	12.80	16,100
December	4,980	2,930	3,980	16.90	19.50	245,000
The year	4,980	32	1,410	6.00	81.24	874,810

ENGLISHMANS RIVER.—(1030).

Location.—One-half mile above mouth, 2 miles from Parksville.

Records Available.—Daily discharges February 15, 1913, to December 31, 1913, May 19, 1914, to September 21, 1914, December 9, 1914, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—One hundred and eleven square miles.

Gauge.—Twelve-foot enamelled staff in 2 sections, located on right bank, 100 feet upstream from metering section. Read daily by Mr. L. Mandley.

Channel.—Straight for 300 feet above and below section, even gravel bed.

Discharge Measurements.—Four in 1913, by Provincial Water Rights Branch, four in 1914, and three in 1915.

Winter Flow.—Open all year.

Accuracy.—"B" (between discharge of 100 and 600 cubic feet per second "C" (below discharge of 100 and above 600 cubic feet per second). This accuracy is kept low on account of the shifting of channel each year.

Co-operation.—Provincial Water Rights Branch established station in 1913.

Discharge Measurements of Englishmans River 1½ Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 14	Milner & Webb	1,933	110	279	2.02	3.00	563.0
Sept. 3	H. C. Hughes	1,505	38	24	0.45	1.60	10.7[1]
Nov. 2	Webb & Balls	1,057	72	453	2.18	3.50	986.0[1]

[1] Not at regular section.

Daily Gauge Height and Discharge of Englishmans River 1½ Mile above Mouth for 1915.

(Drainage area, 111 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.60	1,080	2.80	440	2.90	500	3.75	1,240	2.15	165	2.10	150
2	3.50	980	3.10	640	2.70	390	5.10	2,840	2.10	150	2.05	135
3	3.95	1,460	2.95	530	2.60	340	4.60	2,240	2.10	150	2.05	135
4	3.30	800	2.85	470	2.70	390	3.65	1,130	2.10	150	2.05	135
5	2.95	530	2.90	500	2.60	340	3.20	720	2.20	180	2.15	165
6	2.90	500	3.15	680	2.60	340	3.10	640	2.40	250	2.10	150
7	2.75	415	3.85	1,350	2.55	320	3.00	560	2.40	250	2.00	120
8	3.45	935	3.70	1,180	2.55	320	3.00	560	2.50	290	2.00	120
9	3.25	760	3.65	1,130	2.50	290	3.00	560	2.50	290	2.00	120
10	3.40	890	3.40	890	2.45	270	3.00	560	2.60	340	1.95	105
11	5.25	3,020	3.10	640	2.40	250	2.90	500	2.65	365	2.00	120
12	3.90	1,400	3.00	560	2.40	250	3.00	560	2.55	315	2.00	120
13	3.50	980	2.90	500	2.40	250	3.20	720	2.50	290	2.00	120
14	3.20	720	2.80	440	3.00	560	3.00	560	2.45	270	1.95	105
15	2.95	530	2.75	420	4.90	2,600	2.85	470	2.40	250	1.95	105
16	2.80	440	2.75	420	3.90	1,400	2.80	440	2.30	210	1.95	105
17	2.70	390	3.10	640	4.10	1,640	2.80	440	2.40	250	1.95	105
18	2.60	340	3.00	560	4.20	1,760	2.85	470	2.40	250	1.95	105
19	2.60	340	2.90	500	4.00	1,520	2.80	440	2.40	250	1.95	105
20	2.50	290	2.80	440	3.30	800	2.65	370	2.40	250	1.95	105
21	2.40	250	2.75	420	3.30	800	2.50	290	2.30	210	1.90	90
22	2.35	230	2.70	390	3.50	980	2.40	250	2.30	210	1.90	90
23	2.35	230	2.80	440	3.30	800	2.40	250	2.25	195	1.90	90
24	2.30	210	2.90	500	3.10	640	2.35	230	2.20	180	1.90	90
25	2.30	210	3.25	760	2.90	500	2.20	180	2.30	210	1.90	90
26	2.30	210	3.00	560	2.75	420	2.20	180	2.30	210	1.85	78
27	2.20	180	3.00	560	2.65	360	2.15	165	2.50	290	1.80	65
28	2.20	180	3.00	500	2.50	290	2.20	180	2.30	210	1.80	65
29	2.15	165	....	....	2.50	290	2.20	180	2.20	180	1.80	65
30	2.15	165	....	....	2.65	360	2.20	180	2.15	165	1.80	65
31	2.20	180	....	....	2.70	390	....	....	2.10	150	....	....

	July.		August.		September.		October.		November.		December.	
1	1.80	65	1.60	30	1.57	25	1.57	25	4.10	1,640	2.90	500
2	1.80	65	1.60	30	1.57	25	1.60	30	3.45	935	3.00	560
3	1.80	65	1.60	30	1.57	25	1.60	30	3.20	720	5.20	2,960
4	1.80	65	1.60	30	1.57	25	1.60	30	3.00	560	4.40	2,000
5	1.75	55	1.60	30	1.57	25	1.60	30	2.85	470	4.65	2,300
6	1.75	55	1.60	30	1.57	25	1.60	30	2.80	440	4.50	2,120
7	1.75	55	1.60	30	1.57	25	1.60	30	2.60	340	3.80	1,290
8	1.75	55	1.60	30	1.57	25	1.60	30	2.50	290	5.75	3,620
9	1.75	55	1.60	30	1.57	25	1.67	40	2.40	250	4.40	2,000
10	1.70	45	1.60	30	....	25	1.67	40	2.30	210	3.75	1,240
11	1.70	45	1.60	30	....	24	1.67	40	2.28	200	3.40	890
12	1.70	45	1.60	30	....	24	1.67	40	2.20	180	3.40	890
13	1.70	45	1.60	30	....	24	1.67	40	2.18	170	3.40	890
14	1.65	37	1.60	30	....	24	1.67	40	2.20	180	3.20	720
15	1.65	37	1.60	30	....	24	1.67	40	2.40	250	3.20	720
16	1.70	45	1.60	30	....	24	1.70	45	2.70	390	2.90	500
17	1.70	45	1.57	25	....	24	1.70	45	3.40	890	2.80	440
18	1.65	37	1.57	25	....	24	1.87	85	3.30	800	2.70	390
19	1.65	37	1.57	25	....	24	2.65	365	3.30	800	2.70	390
20	1.65	37	1.57	25	1.55	23	2.80	440	3.00	560	4.50	2,120
21	1.65	37	1.57	25	1.55	23	3.40	890	2.90	500	5.40	3,200
22	1.65	37	1.57	25	1.55	23	3.30	800	3.10	640	4.40	2,000
23	1.65	37	1.57	25	1.55	23	3.20	720	3.95	1,460	3.90	1,400
24	1.65	37	1.57	25	1.55	23	3.60	1,080	3.65	1,130	3.50	980
25	1.65	37	1.57	25	1.55	23	4.80	2,480	3.60	1,080	3.20	720
26	1.65	37	1.57	25	....	23	4.60	2,240	3.80	1,290	3.10	640
27	1.60	30	1.57	25	....	23	5.60	3,440	3.40	890	2.90	500
28	1.60	30	1.57	25	....	23	3.80	1,290	3.20	720	2.90	500
39	1.60	30	1.57	25	....	23	3.60	1,080	3.10	640	3.00	560
20	1.60	30	1.57	25	....	23	3.30	800	3.15	680	2.85	470
31	1.60	30	1.57	25	....	....	5.10	2,840	....		2.85	470

Monthly Discharge of Englishmans River 1½ Mile above Mouth for 1915.

(Drainage area, 111 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	3,020	165	613	5.53	6.38	37,700
February	1,350	390	609	5.49	5.72	33,800
March	2,600	250	656	5.91	6.81	40,300
April	2,840	165	604	5.44	6.07	35,900
May	365	150	230	2.07	2.39	14,100
June	165	65	107	0.96	1.07	6,370
July	65	30	44	0.40	0.46	2,700
August	30	25	28	0.25	0.29	1,720
September	25	23	24	0.22	0.25	1,430
October	2,840	25	618	5.57	6.42	38,000
November	1,640	170	644	5.80	6.47	38,300
December	2,960	390	1,220	11.00	12.70	75,000
The year	3,020	23	450	4.05	55.03	325,320

HASLAM CREEK.—(1029).

Location.—Low water section 500 feet below Canadian Collieries Railway bridge, 6 miles from Ladysmith.

High water section downstream side of bridge.

Records Available.—Daily discharges July 3, 1914, to July 31, 1915. Station discontinued as stream was considered of little importance. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Twenty-seven square miles.

Gauge.—Six-foot enamel staff on piling of railway bridge, left bank, read bi-weekly by Mr. J. B. Wier.

Channel.—Low water section—gravel bed, channel straight 50 feet above and below section.

High water section—stream flows at small angle to bridge, gravel bed.

Discharge Measurements.—Four in 1914, one in 1915, covering all but high stage.

Winter Flow.—Open all year.

Accuracy.—"B" (up to discharge of 160 cubic feet per second). "C" (above 160 cubic feet per second).

Discharge Measurements of Haslam Creek 2 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 26	Cline & Webb	1,933	....	....	....	1.35	119.0

NOTE.—Station discontinued July, 1915.

Daily Gauge Height and Discharge of Haslam Creek 2 Miles above Mouth for 1915.

(Drainage area, 27 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	80	....	80	....	120	....	250	0.6	18	....	26
2	....	120	....	90	1.4	120	....	450	....	18	0.7	24
3	....	160	1.3	100	....	120	2.5	660	....	18	....	22
4	....	200	.....	200	....	120	....	600	....	18	....	20
5	1.7	220	....	300	....	140	....	500	0.6	18	0.6	18
6	....	280	2.2	480	1.5	140	....	400	....	18	....	18
7	....	340	....	420	....	120	1.9	310	....	18	0.6	18
8	....	400	2.0	360	....	110	....	260	0.6	18	....	18
9	2.2	480	....	320	1.3	100	1.7	220	....	18	0.6	18
10	....	450	....	280	....	90	....	200	....	18	....	18
11	....	420	....	240	....	90	....	180	....	18	....	18
12	....	390	....	190	1.2	80	....	160	0.6	18	0.6	18
13	2.0	360	1.5	140	....	100	....	140	....	18	....	18
14	....	300	....	160	....	200	1.4	120	....	18	....	16
15	....	240	....	180	....	300	....	100	0.6	18	0.5	14
16	1.6	180	....	200	....	450	....	90	....	18	....	14
17	....	160	1.7	220	2.4	600	1.2	80	....	18	....	16
18	....	120	....	190	....	500	....	70	....	18	....	18
19	1.3	100	....	150	....	400	1.1	60	0.6	18	0.6	18
20	....	90	1.4	120	1.9	310	....	60	....	18	....	16
21	....	80	....	120	....	310	....	50	....	20	0.5	14
22	....	70	....	120	....	310	1.0	50	0.7	24	....	14
23	1.1	60	....	100	1.9	310	....	45	....	24	....	12
24	....	55	1.3	100	....	250	0.9	40	....	24	0.4	10
25	1.0	50	....	100	....	200	....	35	....	24	....	12
26	....	45	....	120	....	150	....	30	0.7	24	0.5	14
27	....	40	1.4	120	1.3	100	....	27	....	32	....	12
28	0.9	40	....	120	....	100	0.7	24	0.9	40	0.4	10
29	....	50	....	....	....	100	....	22	....	36	....	10
30	....	60	....	....	....	120	....	20	....	32	0.4	10
31	....	79	....	....	1.4	120	....	....	....	28	....	....

	July.		August.		September.		October.		November.		December.	
1	....	10										
2	0.40	10										
3	....	10										
4	....	8										
5	....	8										
6	0.30	6										
7	....	6										
8	....	6										
9	0.30	6										
10	....	6										
11	....	6										
12	....	6										
13	....	6										
14	0.30	6										
15	....	6										
16	....	6										
17	0.30	6										
18	....	6										
19	....	6										
20	....	6										
21	0.30	6										
22	....	5										
23	0.20	4										
24	0.20	4										
25	....	4										
26	....	4										
27	....	4										
28	0.20	4										
29	....	4										
30	....	4										
31	0.20	4										

Monthly Discharge of Haslam Creek 2 Miles above Mouth for 1915.

(Drainage area, 27 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	480	40	184.0	6.81	7.85	11,300
February	480	80	190.0	7.04	7.33	10,600
March	600	80	202.0	7.48	8.62	12,400
April	660	20	175.0	6.48	7.23	10,400
May	40	18	21.5	0.80	0.92	1,320
June	26	10	16.0	0.59	0.66	952
July	10	4	5.9	0.22	0.25	363
The period	660	4	113.4	4.20	32.86	47,335

Note.—Station discontinued July, 1915.

KOKSILAH RIVER.—(1026).

Location.—Two miles from mouth, upstream side of Esquimalt and Nanaimo Railway bridge.

Records Available.—Daily discharges May 12, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—One hundred and twenty-four square miles.

Gauge.—Fourteen-foot staff on left bank, 600 feet above bridge, read daily by Koksilah Charlie.

Channel.—Gravel bed, channel straight for 100 feet above and 300 feet below section, 2 channels at low water.

Discharge Measurements.—Six in 1914, three in 1915, covering all stages.

Winter Flow.—Open all year.

Accuracy.—"A" (up to discharge of 400 cubic feet per second). "B" (between discharge of 400 and 2,000 cubic feet per second). "C" (above discharge of 2,000 cubic feet per second).

Discharge Measurements of Koksilah River 2 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 23	Cline & Webb	1,933	100	135	2.15	2.43	291.0
Aug. 28	H. C. Hughes	1,505	38	26	0.40	1.03	10.5[1]
Dec. 8	C. E. Webb	1,056	146	1,210	4.83	0.50	5,840.0[2]

[1] Not at regular section.
[2] Extreme high water.

Daily Gauge Height and Discharge of Koksilah River 2 Miles above Mouth for 1915.

(Drainage area, 124 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.0	160	3.0	500	2.6	340	4.0	1,030	2.1	180	1.6	80
2	2.0	160	3.2	590	2.6	340	4.6	1,420	2.0	160	1.5	60
3	2.0	160	3.0	500	2.6	340	4.8	1,560	2.0	160	1.5	60
4	2.2	210	2.8	420	2.7	380	4.6	1,420	2.0	160	1.5	60
5	2.3	240	2.6	340	2.7	380	4.0	1,030	1.8	120	1.5	60
6	2.6	340	2.5	300	2.7	380	3.6	790	1.8	120	1.5	60
7	2.8	420	2.4	270	2.6	340	3.4	690	1.7	100	1.5	60
8	3.0	500	2.5	300	2.6	340	3.0	500	1.6	80	1.5	60
9	3.3	640	2.5	300	2.8	420	2.8	420	1.5	60	1.6	80
10	4.0	1,030	2.6	340	2.8	420	2.6	340	1.5	60	1.6	80
11	4.6	1,420	2.6	340	3.2	590	2.4	270	1.6	80	1.5	60
12	5.0	1,700	2.7	380	3.4	690	2.3	240	1.6	80	1.5	60
13	4.8	1,560	2.8	420	3.5	740	2.3	240	1.6	80	1.4	45
14	4.2	1,150	2.8	420	3.4	690	2.3	240	1.6	80	1.4	45
15	3.8	910	2.7	380	3.3	640	2.3	240	1.6	80	1.35	40
16	3.5	740	2.6	340	3.2	590	2.2	210	1.6	80	1.35	40
17	3.0	500	2.6	340	3.0	500	2.2	210	1.6	80	1.2	25
18	2.8	420	2.6	340	3.0	500	2.2	210	1.8	120	1.2	25
19	2.6	340	2.5	300	3.0	500	2.2	210	1.8	120	1.2	25
20	2.6	340	2.7	380	2.8	420	2.2	210	2.0	160	1.2	25
21	2.6	340	2.7	380	2.8	420	2.1	180	2.0	160	1.2	25
22	2.5	300	2.6	340	2.8	420	2.0	160	2.0	160	1.2	25
23	2.5	300	2.6	340	2.7	380	2.0	160	2.0	160	1.2	25
24	2.4	270	2.5	300	2.7	380	2.0	160	1.9	140	1.15	21
25	2.4	270	2.5	300	2.8	420	2.0	160	1.8	120	1.15	21
26	2.8	420	2.5	300	2.8	420	2.0	160	1.8	120	1.15	21
27	3.0	500	2.5	300	2.8	420	2.1	180	1.8	120	1.1	17
28	3.0	500	2.5	300	2.8	420	2.1	180	1.8	120	1.1	17
29	2.8	420	....	....	3.2	590	2.1	180	1.8	120	1.1	17
30	2.8	420	....	....	3.4	690	2.1	180	1.6	80	1.1	17
31	2.8	420	....	....	3.6	790	....	....	1.6	80	....	....

	July.		August.		September.		October.		November.		December.	
1	1.00	12	1.10	17	0.90	9	1.30	35	6.20	2620	3.80	910
2	1.00	12	1.10	17	0.90	9	1.50	60	3.40	690	3.80	910
3	1.00	12	1.10	17	0.90	9	1.50	60	3.20	590	4.20	1,150
4	1.00	12	1.10	17	0.90	9	1.20	25	2.80	420	6.40	2,790
5	1.00	12	1.10	17	0.90	9	1.20	25	2.80	420	5.20	1,840
6	1.10	17	1.10	17	0.90	9	1.20	25	2.80	420	4.40	1,280
7	1.10	17	1.10	17	0.90	9	1.20	25	3.00	500	9.20	5,530
8	1.15	21	1.10	17	0.90	9	1.20	25	3.20	590	6.30	2,700
9	1.20	25	1.10	17	0.90	9	1.20	25	2.90	460	4.80	1,560
10	1.20	25	1.10	17	0.85	8	1.20	25	2.90	460	4.30	1,210
11	1.20	25	1.10	17	0.85	8	1.20	25	2.80	420	4.30	1,210
12	1.20	25	1.10	17	0.85	8	1.20	25	2.80	420	4.20	1,150
13	1.20	25	1.10	17	0.85	8	1.20	25	2.80	420	4.40	1,280
14	1.20	25	1.10	17	0.85	8	1.20	25	3.40	690	3.80	910
15	1.20	25	1.03	14	0.85	8	1.20	25	3.60	790	3.60	790
16	1.20	25	1.13	19	0.85	8	1.20	25	4.40	1,280	3.60	790
17	1.20	25	1.05	15	0.85	8	1.20	25	3.60	790	3.80	910
18	1.20	25	1.05	15	0.85	8	1.20	25	3.40	690	3.80	910
19	1.20	25	1.00	12	0.80	7	2.40	270	3.20	590	3.60	790
20	1.20	25	1.00	12	0.80	7	2.60	340	3.00	500	3.90	970
21	1.20	25	1.00	12	0.80	7	2.60	340	4.20	1,150	8.80	5,100
22	1.20	25	1.00	12	0.80	7	3.00	500	3.80	910	6.40	2,790
23	1.20	25	1.00	12	0.80	7	3.00	500	4.40	1,280	3.60	790
24	1.20	25	1.00	12	0.80	7	3.20	590	4.60	1,420	3.40	690
25	1.20	25	1.00	12	0.80	7	3.80	910	5.40	1,980	3.40	690
26	1.20	25	1.00	12	0.80	7	3.80	910	5.00	1,700	3.20	590
27	1.17	23	0.95	11	0.80	7	4.20	1,150	4.20	1,150	3.20	590
28	1.18	23	0.95	11	0.80	7	4.20	1,150	4.80	1,560	3.20	590
29	1.17	23	0.95	11	0.80	7	4.20	1,150	5.20	1,840	3.00	500
30	1.18	23	0.95	11	0.80	7	4.20	1,150	4.00	1,030	3.00	500
31	1.15	21	0.95	11	....	....	6.20	2,620	....	......	3.00	500

Monthly Discharge of Koksilah River 2 Miles above Mouth for 1915.

(Drainage area, 124 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,700	160	550.0	4.44	5.12	33,800
February	590	270	360.0	2.90	3.02	20,000
March	790	340	480.0	3.87	4.46	29,500
April	1,560	160	440.0	3.55	3.96	26,200
May	180	60	114.0	0.92	1.06	7,010
June	80	17	42.0	0.34	0.38	2,500
July	25	12	21.9	0.18	0.21	1,350
August	19	11	14.6	0.12	0.14	898
September	9	7	7.9	0.64	0.71	4,700
October	2,620	25	390.0	3.14	3.62	24,000
November	2,620	420	926.0	7.47	8.33	55,100
December	5,530	500	1,390.0	11.20	12.90	85,500
The year	5,530	7	394.7	3.23	43.91	290,558

LITTLE QUALICUM RIVER.—(1031).

Location.—At outlet from Cameron lake, downstream side of highway bridge.

Records Available.—Daily discharges February 27, 1913, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Fifty-four square miles.

Gauge.—Twelve foot wooden staff nailed to crib near shore of lake, 500 feet from head of river. Read twice daily by Mr. T. B. McBey.

Channel.—Straight on both sides of section for 100 feet. Even gravel bed. Confined by bridge abutments in high water.

Discharge Measurements.—Eight in 1913 and 1914, by Provincial Water Rights Branch, seven in 1914 and 1915, covering all stages.

Winter Flow.—Open all year.

Accuracy.—"A" (between discharge of 30 and 600 cubic feet per second.) "B" (between discharge of 600 and 1,000 cubic feet per second.) "C" (above discharge of 1,000 cubic feet per second).

Co-operation.—Provincial Water Rights Branch established station in 1913.

Discharge Measurements of Little Qualicum River at Cameron Lake for 1915.

Date	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 16	Milner & Webb	1,933	60	160	2.73	2.80	437
Sept. 5	H. C. Hughes	1,505	44	33	0.94	0.39	31

Daily Gauge Height and Discharge of Little Qualicum River at Cameron Lake for 1915.

(Drainage area, 54 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.52	175	1.45	165	1.93	240	3.35	550	1.68	195	1.60	185
2	2.04	265	1.49	170	1.86	225	4.25	805	1.66	190	1.60	185
3	2.33	320	1.52	175	1.83	220	5.0	1,030	1.62	190	1.53	175
4	2.39	335	1.57	180	1.79	215	4.73	950	1.61	185	1.49	170
5	2.35	325	1.60	185	1.73	205	4.8	970	1.60	185	1.48	165
6	2.24	305	1.63	190	1.70	200	3.75	655	1.65	190	1.48	165
7	2.18	290	1.84	225	1.69	200	3.48	580	1.73	205	1.46	165
8	2.23	300	2.05	265	1.68	195	3.32	540	1.79	215	1.39	155
9	2.28	310	2.23	300	1.64	190	3.18	505	1.83	220	1.37	150
10	2.32	320	2.38	330	1.59	185	2.97	460	1.89	235	1.32	145
11	2.74	410	2.38	330	1.55	175	2.89	445	2.2	295	1.26	135
12	2.99	465	2.38	330	1.54	175	2.83	430	2.12	280	1.21	125
13	2.89	445	2.18	290	1.5	170	2.99	470	2.18	290	1.19	125
14	2.74	410	2.11	275	1.81	215	2.98	465	2.10	275	1.17	120
15	2.59	375	2.04	265	2.70	400	2.94	455	2.06	265	1.17	120
16	2.49	355	2.0	255	3.33	545	2.82	425	2.0	255	1.17	120
17	2.28	310	2.05	265	3.49	580	2.77	415	1.89	235	1.10	110
18	2.16	285	2.08	270	3.90	700	2.7	400	1.88	230	1.10	110
19	2.04	265	2.06	265	3.74	650	2.66	390	1.80	215	1.10	110
20	1.91	235	2.0	255	3.35	550	2.64	385	1.78	210	1.10	110
21	1.84	225	1.97	250	3.3	535	2.49	355	1.76	210	1.10	110
22	1.77	210	1.90	235	3.24	520	2.36	325	1.73	205	1.10	110
23	1.70	200	1.84	225	2.99	470	2.23	300	1.73	205	1.00	100
24	1.62	190	1.82	220	2.95	460	2.10	275	1.70	200	1.00	100
25	1.59	185	1.96	245	2.79	420	2.07	270	1.70	200	0.90	85
26	1.49	170	1.87	230	2.75	410	1.97	250	1.71	200	0.90	85
27	1.46	165	1.86	225	2.65	390	1.89	235	1.70	200	0.87	80
28	1.39	155	1.99	255	2.45	345	1.79	215	1.70	200	0.83	75
29	1.38	150	....	....	2.24	305	1.78	210	1.70	200	0.80	70
30	1.35	150	....	....	2.18	290	1.71	200	1.70	200	0.80	70
31	1.41	155	....	....	2.20	295	....	....	1.70	200	....	....

	July.		August.		September.		October.		November.		December.	
1	0.80	70	0.57	47	0.42	32	0.40	30	4.81	975	2.20	295
2	0.79	69	0.56	46	0.42	32	0.49	39	4.30	820	3.23	300
3	0.79	69	0.53	43	0.41	31	0.50	40	3.69	635	2.80	420
4	0.79	69	0.52	42	0.41	31	0.50	40	3.25	520	3.67	630
5	0.78	68	0.50	40	0.42	32	0.50	40	2.95	455	3.94	710
6	0.76	66	0.49	39	0.41	31	0.50	40	2.69	400	3.85	685
7	0.74	64	0.48	38	0.39	29	0.49	39	2.47	350	3.73	650
8	0.71	61	0.48	38	0.40	30	0.49	39	2.30	315	3.85	685
9	0.69	59	0.48	38	0.45	35	0.49	39	2.08	270	3.75	655
10	0.69	59	0.48	38	0.46	36	0.48	38	1.98	250	3.65	625
11	0.68	58	0.48	38	0.46	36	0.48	38	1.87	230	3.57	600
12	0.66	56	0.48	38	0.47	37	0.47	37	1.77	210	3.22	515
13	0.66	56	0.48	38	0.47	37	0.49	39	1.67	195	2.98	465
14	0.66	56	0.45	35	0.47	37	0.49	39	1.60	185	2.85	430
15	0.67	57	0.47	37	0.44	34	0.51	41	1.60	185	2.68	395
16	0.67	57	0.46	36	0.41	31	0.52	42	1.60	185	2.58	370
17	0.67	57	0.46	36	0.40	30	0.52	42	1.60	185	2.35	325
18	0.68	58	0.46	36	0.40	30	0.65	55	1.78	210	2.11	275
19	0.66	56	0.46	36	0.40	30	0.70	60	1.86	225	2.30	315
20	0.67	57	0.46	36	0.40	30	0.95	92	1.90	235	2.85	430
21	0.65	55	0.50	40	0.40	30	2.00	255	1.90	235	3.28	530
22	0.63	53	0.50	40	0.39	29	2.75	410	1.92	240	3.65	625
23	0.61	51	0.52	42	0.39	29	2.90	445	2.20	295	3.85	685
24	0.60	50	0.50	40	0.39	29	2.92	450	2.10	275	3.63	620
25	0.59	49	0.48	38	0.39	29	3.00	470	2.25	305	3.35	545
26	0.58	48	0.45	35	0.39	29	3.35	545	2.44	345	2.95	455
27	0.58	48	0.42	32	0.40	30	4.70	940	2.45	345	2.78	415
28	0.58	48	0.40	30	0.40	30	6.50	1,530	2.30	315	2.65	385
29	0.58	48	0.40	30	0.39	29	5.40	1,150	2.33	320	2.52	360
30	0.58	48	0.40	30	0.38	28	4.73	950	2.30	315	2.40	335
31	0.57	47	0.40	30	....	....	4.83	980			2.28	310

Monthly Discharge of Little Qualicum River at Cameron Lake for 1915.

(Drainage area, 54 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	465	150	272.0	5.04	5.81	16,700
February	330	165	245.0	4.54	4.73	13,600
March	700	170	344.0	6.37	7.34	21,200
April	1,030	200	465.0	8.62	9.62	27,700
May	295	185	218.0	4.04	4.66	13,400
June	185	70	124.0	2.30	2.57	7,380
July	70	47	57.0	1.05	1.21	3,500
August	47	30	37.5	0.69	0.80	2,310
September	37	28	31.4	0.58	0.65	1,870
October	1,530	30	290.0	5.37	6.19	17,800
November	975	185	334.0	6.18	6.90	19,900
December	710	295	485.0	8.98	10.40	29,800
The year	1,530	28	242.0	4.48	60.88	175,160

NANAIMO RIVER.—(1028).

Location.—Six miles from mouth, 800 feet upstream from Canadian Collieries Railway bridge, 8 miles from Ladysmith.

Records Available.—Daily discharges February 11, 1913, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Two hundred and forty-nine square miles.

Gauge.—Twelve-foot wooden staff nailed to tree, left bank, 25 feet above section. Gauge read daily by Miss Jeane Whisker.

Channel.—Straight for 200 feet on either side of section, even gravel bed, good control 400 feet downstream.

Discharge Measurements.—One in 1911, four in 1913, and two in 1914, by Provincial Water Rights Branch; two in 1914 and three in 1915, covering all but highest stage.

Winter Flow.—Open all year.

Accuracy.—"B" (up to discharge of 3,000 cubic feet per second). "C" (above discharge of 3,000 cubic feet per second).

Co-operation.—Provincial Water Rights Branch established station in 1913.

Discharge Measurements of Nanaimo River 6 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 25	Cline & Webb	1,933	135	467	3.40	3.27	1,620.0
Sept. 1	H. C. Hughes	1,505	110	78	0.46	0.40	35.6
Dec. 11	C. E. Webb	1,056	140	556	4.64	4.01	2,580.0

Daily Gauge Height and Discharge of Nanaimo River 6 Miles above Mouth for 1915.

(Drainage area, 249 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.62	1,880	2.49	810	2.95	1,160	5.01	4,600	1.81	425	1.93	485
2	4.24	2,900	3.01	1,210	2.77	1,020	7.22	9,660	1.74	395	1.85	445
3	4.27	2,970	3.00	1,200	2.68	950	5.48	5,650	1.85	445	1.79	415
4	3.71	1,990	2.80	1,040	2.74	990	4.66	3,800	1.92	480	1.73	390
5	3.29	1,490	2.78	1,020	2.71	970	3.92	2,290	2.01	525	1.72	390
6	3.01	1,210	3.73	2,020	2.79	1,030	3.46	1,670	2.10	580	1.75	400
7	3.08	1,280	3.87	2,220	2.79	1,030	3.65	1,910	2.13	600	1.62	350
8	3.74	2,040	3.98	2,370	2.69	950	3.64	1,900	2.10	580	1.59	335
9	3.58	1,820	3.99	2,390	2.58	880	3.55	1,790	2.02	530	1.59	335
10	3.76	2,060	3.85	2,190	2.48	810	3.34	1,540	2.23	660	1.54	315
11	5.08	4,750	3.56	1,800	2.40	760	3.12	1,320	2.44	780	1.47	290
12	4.55	3,560	3.29	1,490	2.39	750	3.29	1,490	2.53	840	1.43	280
13	3.97	2,360	3.17	1,370	2.39	750	3.58	1,820	2.40	760	1.30	240
14	3.55	1,780	2.95	1,160	3.39	1,590	3.41	1,610	2.30	700	1.33	250
15	3.20	1,400	2.80	1,040	5.66	6,070	3.13	1,330	2.12	590	1.32	245
16	2.94	1,150	2.71	970	4.90	4,350	2.99	1,190	2.00	520	1.27	230
17	2.74	990	3.15	1,350	4.93	4,420	2.95	1,160	1.95	485	1.26	230
18	2.57	870	3.28	1,480	4.95	4,470	2.94	1,150	2.03	540	1.27	230
19	2.45	790	3.13	1,330	4.28	2,990	2.82	1,060	2.02	530	1.27	230
20	2.37	740	2.90	1,120	3.74	2,040	2.73	980	1.99	515	1.25	225
21	2.29	690	2.72	980	3.77	2,080	2.53	840	1.81	475	1.15	195
22	2.20	640	2.62	900	3.93	2,300	2.38	750	1.90	470	1.10	180
23	2.14	600	2.67	940	3.86	2,200	2.22	650	1.91	475	1.14	190
24	2.08	570	3.04	1,240	3.55	1,790	2.15	610	1.89	465	1.15	195
25	2.02	530	3.55	1,790	3.23	1,430	2.11	590	1.91	475	1.22	215
26	1.99	520	3.37	1,570	2.92	1,140	2.07	560	1.99	515	1.07	170
27	1.90	470	3.21	1,410	2.69	950	1.99	510	2.38	750	1.06	170
28	1.86	450	3.09	1,290	2.51	830	1.93	490	2.47	800	1.04	160
29	1.81	420	....	....	2.54	850	1.92	480	2.33	720	0.99	150
30	1.79	420	....	....	2.92	1,140	1.88	460	2.13	600	0.96	140
31	1.80	420	....	....	2.99	1,190	....	....	2.01	530	....	....

	July.		August.		September.		October.		November.		December.	
1	0.94	140	0.60	80	0.40	60	0.39	60	5.38	5,430	3.30	1,500
2	0.93	135	0.58	78	0.40	60	0.56	75	4.43	3,300	3.10	1,300
3	0.89	130	0.57	77	0.40	60	0.97	145	3.72	2,010	5.54	5,790
4	0.88	125	0.56	76	0.41	61	0.86	120	3.42	1,620	5.54	5,790
5	0.87	125	0.55	75	0.35	55	0.93	135	3.18	1,380	5.52	5,750
6	0.84	120	0.54	74	0.38	58	0.94	140	3.04	1,240	5.50	5,700
7	0.80	110	0.53	73	0.42	62	0.91	130	2.70	960	4.80	4,120
8	0.79	110	0.53	73	0.43	63	0.87	125	2.54	850	6.72	8,510
9	0.79	110	0.52	72	0.45	65	0.80	110	2.42	770	5.70	6,160
10	0.77	105	0.50	70	0.40	60	0.77	105	2.30	700	4.76	4,030
11	0.77	105	0.50	70	0.40	60	0.74	100	2.26	675	4.00	2,400
12	0.78	105	0.46	66	0.40	60	0.72	95	2.11	585	3.65	1,910
13	0.82	115	0.46	66	0.40	60	0.83	115	2.02	530	3.56	1,800
14	0.81	110	0.45	65	0.41	61	1.20	210	2.02	530	3.44	1,650
15	0.83	115	....	65	0.40	60	1.12	185	2.21	645	3.18	1,380
16	0.85	120	0.44	64	0.41	61	1.14	190	2.85	1,080	3.10	1,300
17	0.89	130	0.44	64	0.39	59	1.12	185	3.35	1,550	2.86	1,090
18	0.84	120	0.42	62	0.40	60	1.14	190	3.46	1,670	2.73	985
19	0.81	110	0.42	62	0.39	59	1.18	205	3.65	1,910	3.86	2,200
20	0.80	110	0.40	60	0.40	60	2.50	820	3.70	1,980	4.48	3,410
21	0.79	110	0.41	61	0.41	61	4.05	2,500	3.20	1,400	5.85	6,500
22	0.74	100	0.40	60	0.38	58	4.60	3,670	3.25	1,450	5.65	6,040
23	0.72	95	0.40	60	0.38	58	4.00	2,400	3.96	2,340	4.74	3,980
24	0.71	90	0.41	61	0.38	58	3.57	1,810	3.76	2,060	4.16	2,740
25	0.69	90	0.40	60	0.37	57	4.21	2,840	3.95	2,330	3.58	1,820
26	0.67	87	0.42	62	0.38	58	5.26	5,160	4.47	3,380	3.25	1,450
27	0.66	86	0.37	57	0.37	57	6.05	6,950	4.25	2,920	2.97	1,180
28	0.65	85	0.37	57	0.37	57	7.08	9,330	3.44	1,650	3.18	1,380
29	0.64	84	0.37	57	0.37	57	5.10	4,800	3.56	1,800	3.05	1,250
30	0.63	83	0.39	59	0.37	57	4.18	2,780	3.44	1,650	2.85	1,080
31	0.61	81	0.40	60	....	....	6.08	7,030	....	....	2.78	1,020

Monthly Discharge of Nanaimo River 6 Miles from Mouth for 1915.

(Drainage area, 249 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	4,750	420	1,410.0	5.67	6.54	86,700
February	2,390	810	1,420.0	5.70	5.94	78,900
March	6,070	750	1,740.0	6.98	8.05	107,000
April	9,660	460	1,795.0	7.21	8.04	107,000
May	840	395	573.0	2.30	2.65	35,200
June	485	140	269.0	1.08	1.21	16,000
July	140	81	108.0	0.43	0.50	6,640
August	80	57	66.0	0.27	0.31	4,060
September	65	55	59.4	0.24	0.27	3,530
October	9,330	60	1,700.0	6.83	7.87	105,000
November	5,430	530	1,680.0	6.75	7.53	100,000
December	8,510	985	3,070.0	12.30	14.20	189,000
The year	9,660	55	1,157.0	4.65	63.11	839,030

OYSTER RIVER.—(1040).

Location.—One mile above mouth, upstream side of Island Highway bridge, 18 miles from Courtenay.

Records Available.—Daily discharges June 1, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Seventy square miles.

Gauge.—Twelve-foot enamel staff, nailed to cribbing on right bank, 20 feet downstream from bridge.

Channel.—Straight for 100 feet above and 400 feet below section; stream flows at a small angle to bridge.

Discharge Measurements.—Four in 1914, four in 1915, covering all but highest stage.

Winter Flow.—Open all year.

Accuracy.—Channel shifts each year. "B" (up to discharge of 1,900 cubic feet per second). "C" (above discharge of 1,900 cubic feet per second).

Discharge Measurements of Oyster River 1 Mile above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 21	Milner & Webb	1.933	133	240	2.80	2.45	666.0[1]
Sept. 26	H. C. Hughes	1,505	38	38	0.79	0.52	29.9[2]
Oct. 28	Webb & Balls	1,057	145	656	7.56	5.50	4,960.0
Oct. 29	Webb & Balls	1,057	137	408	4.36	3.85	1,780.0

[1] Channel shifted since 1914.

[2] Not at regular section.

Daily Gauge Height and Discharge of Oyster River 1 Mile above Mouth for 1915.

(Drinage area, 70 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.60	740	2.00	430	1.95	410	3.30	1,240	1.65	290	1.90	390
2	2.75	830	2.20	530	1.85	370	4.25	2,300	1.60	270	1.90	390
3	2.80	860	1.90	390	1.80	350	3.85	1,780	2.05	455	1.90	390
4	2.30	580	1.70	310	1.80	350	3.35	1,280	2.40	630	2.00	430
5	2.30	580	1.85	370	1.70	310	3.00	1,000	2.65	770	2.50	680
6	2.40	630	2.50	680	1.75	330	2.85	895	2.80	860	2.50	680
7	2.40	630	3.00	1,000	1.60	270	2.80	860	2.95	965	2.45	655
8	2.70	800	3.00	1,000	1.60	270	2.65	770	2.90	930	2.25	555
9	2.35	605	3.00	1,000	1.50	240	2.50	680	2.80	860	2.00	430
10	2.90	930	2.85	895	1.40	215	2.40	630	2.90	930	1.90	390
11	3.20	1,160	2.60	740	1.40	215	2.30	580	2.75	830	1.80	350
12	2.65	770	2.35	605	1.40	215	2.45	655	2.65	770	1.95	410
13	2.40	630	2.15	505	1.40	215	2.55	710	2.55	710	1.95	410
14	2.25	555	1.90	390	1.85	370	2.35	605	2.45	655	1.90	390
15	1.95	410	1.90	390	3.35	1,280	2.35	605	2.30	580	1.85	370
16	1.80	350	1.75	330	3.00	1,000	2.50	680	2.15	505	1.85	370
17	1.70	310	1.70	310	4.05	2,020	2.75	830	2.10	480	1.95	410
18	1.60	270	1.60	270	4.05	2,020	2.80	860	2.30	580	1.70	310
19	1.50	240	1.55	255	3.30	1,240	2.85	895	2.65	770	1.60	270
20	1.40	215	1.50	240	3.00	1,000	2.65	770	2.50	680	1.70	310
21	1.30	190	1.50	240	3.25	1,200	2.45	655	2.45	655	1.60	270
22	1.20	165	1.50	240	3.30	1,240	2.30	580	2.35	605	1.55	255
23	1.20	165	1.60	270	3.30	1,240	2.20	530	2.40	630	1.50	240
24	1.20	165	2.05	455	3.00	1,000	2.20	530	2.40	630	1.50	240
25	1.15	150	2.70	800	2.75	830	2.10	480	2.30	580	1.45	225
26	1.10	140	2.35	605	2.50	680	2.10	480	2.30	580	1.40	215
27	1.10	140	2.30	580	2.30	580	2.00	430	2.40	630	1.35	200
28	1.10	140	2.15	505	2.10	480	2.00	430	2.45	655	1.30	190
29	1.10	140	....	....	2.10	480	2.00	430	2.25	555	1.30	190
30	1.10	140	....	....	2.40	630	1.85	370	2.05	455	1.30	190
31	1.10	140	....	....	2.60	740	....	....	2.00	430	....	....

	July.		August.		September.		October.		November.		December.	
1	1.40	215	0.90	100	0.70	65	0.5	35	3.35	1,280	2.25	550
2	1.40	215	0.90	100	0.70	65	0.7	65	3.05	1,040	2.60	740
3	1.50	240	0.90	100	0.70	65	0.8	80	2.90	930	4.45	2,600
4	1.50	240	0.85	90	0.70	65	0.8	80	2.65	770	3.60	1,520
5	1.40	215	0.80	80	0.70	65	0.8	80	2.50	680	....	1,400
6	1.40	215	0.80	80	0.70	65	0.7	65	2.40	630	3.35	1,280
7	1.30	190	0.80	80	0.70	65	0.7	65	2.40	630	3.05	1,040
8	1.20	165	0.80	80	0.70	65	0.7	65	2.30	580	....	960
9	1.20	165	0.80	80	0.70	65	0.6	50	2.25	550	....	880
10	1.15	150	0.80	80	0.70	65	0.6	50	2.20	530	2.70	800
11	1.10	140	0.80	80	0.70	65	0.6	50	2.10	480	2.70	800
12	1.10	140	0.70	65	0.60	50	....	50	2.10	480	3.40	1,330
13	1.00	120	0.70	65	0.60	50	0.6	50	2.05	450	3.65	1,570
14	1.00	120	0.70	65	0.60	50	0.7	65	2.35	600	3.05	1,040
15	1.05	130	0.70	65	0.60	50	0.7	65	2.50	680	2.65	770
16	1.30	190	0.70	65	0.60	50	0.7	65	2.50	680	2.45	650
17	1.20	165	0.70	65	0.60	50	0.7	65	2.50	680	3.30	580
18	1.20	165	0.70	65	0.55	40	0.8	80	..	680	2.30	580
19	1.10	140	0.70	65	0.50	35	0.8	80	2.50	680	2.30	580
20	1.10	140	0.70	65	0.50	35	2.0	430	2.35	600	3.50	1,420
21	1.10	140	0.70	65	0.50	35	4.55	2,760	2.30	580	3.30	1,240
22	1.10	140	0.70	65	0.50	35	3.80	1,730	2.30	580	3.00	1,000
23	1.00	120	0.70	65	0.50	35	3.35	1,280	2.70	800	2.70	800
24	1.00	120	0.70	65	0.50	35	3.05	1,040	2.50	680		710
25	1.00	120	0.70	65	0.50	35	3.15	1,120	2.80	860	2.40	630
26	1.00	120	0.70	65	0.50	35	5.40	4,690	2.85	890	2.30	580
27	1.00	120	0.70	65	0.50	35	4.80	3,200	2.55	710	2.20	530
28	0.90	100	0.70	65	0.50	35	.	2,370	2.40	630	2.30	580
29	0.90	100	0.70	65	0.50	35	3.80	1,730	2.50	680	...	350
30	0.90	100	....	65	0.50	35	3.25	1,200	.	620	1.00	120
31	0.90	100	....	65	... ..		3.60	1,520			0.95	110

Monthly Discharge of Oyster River 1 Mile above Mouth for 1915.

(Drainage area, 70 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,160	140	444.0	6.34	7.31	27,300
February	1,000	240	512.0	7.31	7.61	28,400
March	2,020	215	703.0	10.04	11.58	43,200
April	2,300	370	785.0	11.21	12.51	46,700
May	965	270	643.0	9.17	10 57	39,500
June	680	190	360.0	5.14	5.74	21,400
July	240	100	153.0	2.19	2.52	9,410
August	100	65	72.5	1.04	1.20	4,460
September	65	35	49.2	0.70	0.78	2,930
October	4,690	35	783.0	11.20	12.90	48,100
November	1,280	450	689.0	9.84	10.98	41,000
December	2,600	110	895.0	12.80	14.80	55,000
The year	4,690	35	507.4	7.25	98.50	367,400

PUNTLEDGE RIVER AT COURTENAY.—(1036).

Location.—One mile from mouth, downstream side of highway bridge, 1 mile from Courtenay.

Records Available.—Daily discharges May 30, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Two hundred square miles.

Gauge.—Fourteen-foot wooden staff nailed to piling of right abutment of railway bridge.

Channel.—Straight for 800 feet upstream and 200 feet downstream from section, 2 channels at extreme high water.

Discharge Measurements.—Four in 1914, three in 1915, covering all but highest stage.

Winter Flow.—Open all year.

Accuracy.—"B" (between discharge of 400 and 4,000 cubic feet per second). "C" (below 400 and above 4,000 cubic feet per second).

Discharge Measurements of Puntledge River 1 Mile above Mouth for 1915.

Date.	Engineer	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 21	Milner & Webb	1,933	140	284	4.20	2.80	1,190
Sept. 26	H. C. Hughes	1,505	115	155	2.27	1.45	352
Oct. 30	Webb & Balls	1,057	325	611	6.35	4.71	3,880

Daily Gauge Height and Discharge of Puntledge River near Mouth for 1915.

(Drainage area, 200 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.35	845	2.21	750	3.27	1,650	4.27	2,980	2.97	1,340	2.90	1,280
2	2.55	990	2.75	1,150	3.05	1,420	4.80	3,890	2.95	1,320	2.90	1,280
3	2.50	950	2.17	720	2.75	1,150	4.72	3,750	2.90	1,280	2.85	1,230
4	2.30	810	2.30	810	2.50	950	4.62	3,570	2.90	1,280	2.85	1,230
5	2.30	810	2.65	1,070	2.55	990	4.47	3,300	2.90	1,280	2.80	1,190
6	2.30	810	2.82	1,210	2.55	990	4.37	3,140	2.92	1,300	2.80	1,190
7	2.35	845	2.87	1,250	2.52	965	4.00	2,550	2.95	1,320	2.80	1,190
8	2.40	880	2.85	1,235	2.50	950	4.60	3,530	2.95	1,320	2.75	1,150
9	2.40	880	2.82	1,210	2.45	915	4.60	3,530	2.90	1,280	2.75	1,150
10	2.75	1,150	2.77	1,170	2.40	880	4.00	2,550	2.85	1,230	2.70	1,110
11	3.20	1,570	2.67	1,090	2.42	895	4.00	2,550	2.80	1,190	2.67	1,090
12	3.10	1,470	2.60	1,030	2.45	915	3.97	2,510	2.80	1,190	2.63	1,070
13	2.95	1,330	2.60	1,030	2.52	965	3.95	2,480	2.80	1,190	2.65	1,070
14	2.90	1,280	2.60	1,030	2.65	1,070	3.85	2,350	2.78	1,170	2.60	1,030
15	2.85	1,240	2.60	1,030	3.35	1,740	3.70	2,160	2.77	1,170	2.60	1,030
16	2.80	1,190	2.60	1,030	4.20	2,870	3.70	2,160	2.75	1,150	2.55	990
17	2.75	1,150	2.60	1,030	4.85	3,980	3.70	2,160	2.75	1,150	2.50	950
18	2.65	1,070	2.60	1,030	4.90	4,070	3.70	2,160	2.80	1,190	2.50	950
19	2.45	915	2.55	990	4.60	3,530	3.70	2,160	2.90	1,280	2.50	950
20	2.25	775	2.55	990	4.42	3,220	3.72	2,190	2.90	1,280	2.50	950
21	2.15	700	2.55	990	4.40	3,190	3.75	2,220	2.85	1,230	2.50	950
22	2.10	670	2.50	950	4.40	3,190	3.75	2,220	2.90	1,280	2.45	915
23	2.10	670	2.50	950	4.35	3,110	3.65	2,090	2.90	1,280	2.45	915
24	2.10	670	2.55	990	4.25	2,950	3.55	1,960	2.90	1,280	2.40	880
25	2.10	670	2.75	1,150	4.12	2,740	3.47	1,870	2.90	1,280	2.40	880
26	2.05	635	3.35	1,740	3.87	2,380	3.42	1,810	2.90	1,280	2.40	880
27	2.05	635	3.60	2,030	3.72	2,190	3.32	1,700	2.90	1,280	2.35	845
28	2.00	600	3.45	1,850	3.62	2,060	3.22	1,590	2.90	1,280	2.35	845
29	1.97	580	....	....	3.65	2,090	3.12	1,490	2.90	1,280	2.30	810
30	1.95	570	....	....	3.85	2,350	3.05	1,420	2.90	1,280	2.30	810
31	1.95	570	....	....	3.97	2,510	....	....	2.90	1,280	....	....

	July.		August.		September.		October.		November.		December.	
1	2.30	810	1.70	440	1.50	340	1.80	490	4.60	3,530	3.07	1,440
2	2.30	810	1.70	440	1.50	340	1.70	440	4.45	3,270	3.25	1,620
3	2.25	775	1.65	415	1.50	340	1.55	365	4.25	2,950	3.45	1,840
4	2.25	775	1.60	390	1.50	340	1.55	365	4.15	2,790	3.65	2,090
5	2.25	775	1.55	365	1.50	340	1.50	340	3.95	2,480	3.85	2,350
6	2.20	740	1.50	340	1.50	340	1.50	340	3.60	2.030	4.05	2,630
7	2.20	740	1.50	340	1.55	365	1.50	340	3.35	1,740	4.15	2,790
8	2.20	740	1.50	340	1.60	390	1.50	340	3.20	1,570	4.35	3,110
9	2.20	740	1.50	340	1.75	465	1.50	340	3.10	1,470	4.40	3,191
10	2.20	740	1.50	340	1.70	440	1.45	320	3.00	1,370	4.47	3,300
11	2.15	705	1.50	340	1.60	390	1.45	320	2.90	1,280	4.37	3,140
12	2.15	705	1.50	340	1.50	340	1.45	320	2.80	1,190	3.90	2,420
13	2.00	600	1.50	340	1.50	340	1.50	340	2.80	1,190	3.55	1,965
14	1.95	570	1.50	340	1.50	340	1.50	340	2.80	1,190	3.35	1,740
15	1.95	570	1.50	340	1.50	340	1.50	340	2.85	1,230	3.15	1,520
16	1.90	540	1.50	349	1.50	340	1.50	340	2.90	1,280	2.95	1,320
17	1.90	540	1.50	340	1.45	320	1.50	340	2.85	1,230	2.80	1,190
18	1.90	540	1.50	340	1.45	320	1.52	350	2.85	1,230	2.80	1,190
19	1.85	515	1.50	340	1.45	320	1.55	365	2.80	1,190	2.90	1,280
20	1.85	515	1.50	340	1.45	320	1.82	500	2.80	1,190	3.28	1,660
21	1.80	490	1.50	340	1.45	320	2.65	1,070	2.75	1,150	3.15	1,520
22	1.80	490	1.50	340	1.45	320	3.45	1,840	2.75	1,150	3.10	1,470
23	1.80	490	1.50	340	1.45	320	4.12	2,740	2.80	1,190	3.00	1,370
24	1.80	490	1.50	340	1.45	320	4.05	2,630	2.80	1,190	3.00	1,370
25	1.80	490	1.50	340	1.45	320	4.45	3,270	2.82	1,210	3.00	1,370
26	1.80	490	1.50	340	1.45	320	5.05	4,350	2.87	1,250	2.90	1,280
27	1.80	490	1.50	340	1.45	320	4.80	3,890	2.90	1,280	2.85	1,230
28	1.80	490	1.50	340	1.45	320	5.05	4,350	2.90	1,280	2.75	1,150
29	1.75	465	1.50	340	1.45	320	4.85	3,980	2.97	1,340	2.68	1,090
30	1.75	465	1.50	340	1.55	365	4.75	3,800	3.00	1,370	2.65	1,070
31	1.70	440	1.50	340	....	....	4.60	3,530	....	....	2.58	1,010

Monthly Discharge of Puntledge River near Mouth for 1915.

(Drainage area, 200 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,570	570	901	4.50	5.19	55,400
February	2,030	720	112	5.60	5.83	6,220
March	4,070	880	2,030	10.15	11.70	125,000
April	3,890	1,420	2,470	12.35	13.78	147,000
May	1,340	1,150	1,260	6.30	7.26	77,500
June	1,280	810	1,030	5.15	5.75	61,300
July	810	440	605	3.02	3.48	37,200
August	440	340	351	1.76	2.03	21,600
September	465	320	344	1.72	1.92	20,500
October	4,350	320	1,380	6.90	7.96	84,800
November	3,530	1,150	1,590	7.95	8.87	94,600
December	3,300	1,010	1,800	9.00	10.40	111,000
The year	4,350	320	1,156	6.20	84.17	842,120

PUNTLEDGE RIVER AT DIVERSION DAM.—(1063).

Location.—At Diversion dam of Puntledge River Hydro-Electric Installation, Canadian Collieries (Dunsmuir), Ltd.

Records Available.—Daily discharges June 7, 1913, to December 31, 1915. Supplied by Canadian Collieries, Ltd. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—One hundred and seventy-five square miles.

Gauge.—Wooden staff located on right bank 50 feet above diversion dam.

Channel.—Even flow over crest of dam. Water flowing through flume to intake is added, giving total flow of stream.

Discharge Measurements.—Daily discharges obtained by weir measurements over dam plus water to flume.

Winter Flow.—Open all year.

Co-operation.—All data on this station supplied by Canadian Collieries (Dunsmuir), Ltd.

Daily Gauge Height and Discharge of Puntledge River at Diversion Dam for 1915.

(Drainage area, 175 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	400	....	460	....	740	....	1,850	....	1,200	....	1,250
2	....	400	....	500	....	740	....	1,850	....	1,100	....	1,250
3	....	520	....	560	....	650	....	1,740	....	1,100	....	1,250
4	....	520	....	560	....	650	....	1,640	....	1,000	....	1,250
5	....	520	....	500	....	650	....	2,250	....	1,000	....	1,250
6	....	520	....	620	....	650	....	2,500	....	1,000	....	1,250
7	....	520	....	620	....	650	....	2,500	....	1,000	....	1,250
8	....	520	....	660	....	650	....	2,280	....	1,000	....	1,250
9	....	680	....	660	....	600	....	2,280	....	880	....	1,250
10	....	680	....	660	....	600	....	2,160	....	800	....	1,250
11	....	1,000	....	800	....	600	....	2,050	....	800	....	1,250
12	....	1,000	....	800	....	600	....	2,050	....	940	....	1,200
13	....	1,080	....	800	....	540	....	2,050	....	1,100	....	1,100
14	....	1,080	....	720	....	530	....	1,760	....	1,100	....	1,000
15	....	1,000	....	800	....	650	....	1,640	....	1,100	....	1,000
16	....	1,000	....	800	....	1,160	....	1,540	....	1,040	....	1,000
17	....	920	....	800	....	1,470	....	800	....	1,040	....	1,000
18	....	920	....	800	....	2,480	....	800	....	1,100	....	1,000
19	....	620	....	740	....	2,600	....	800	....	1,100	....	1,000
20	....	460	....	740	....	2,600	....	800	....	1,100	....	1,000
21	....	440	....	740	....	2,500	....	720	....	1,250	....	1,000
22	....	560	....	740	....	2,500	....	720	....	1,250	....	1,000
23	....	560	....	740	....	2,400	....	1,350	....	1,250	....	1,000
24	....	560	....	740	....	2,280	....	1,740	....	1,250	....	1,000
25	....	560	....	1,200	....	2,200	....	1,540	....	1,250	....	1,000
26	....	460	....	740	....	2,200	....	1,460	....	1,250	....	1,000
27	....	460	....	740	....	2,050	....	1,460	....	1,250	....	1,000
28	....	460	....	740	....	1,840	....	1,460	....	1,250	....	1,000
29	....	460	....	....	....	1,640	....	1,360	....	1,250	....	1,000
30	....	460	....	....	....	1,540	....	920	....	1,250	....	1,000
31	....	460	....	....	....	1,280	....	....	....	1,250	....	....

	July.		August.		September.		October.		November.		December.	
1	....	1,100	....	280	....	240	....	220	....	3,500	....	1,100
2	....	1,100	....	280	....	240	....	240	....	3,500	....	1,040
3	....	1,100	....	280	....	240	....	240	....	3,500	....	1,340
4	....	1,100	....	280	....	240	....	240	....	3,500	....	1,340
5	....	1,100	....	280	....	240	....	240	....	2,000	....	1,960
6	....	1,000	....	280	....	240	....	240	....	1,800	....	2,380
7	....	1,100	....	280	....	280	....	240	....	1,600	....	2,380
8	....	1,100	....	280	....	280	....	240	....	1,350	....	2,380
9	....	750	....	240	....	280	....	240	....	1,200	....	2,000
10	....	750	....	240	....	280	....	240	....	1,100	....	2,000
11	....	670	....	240	....	280	....	240	....	1,040	....	2,000
12	....	670	....	240	....	280	....	210	....	1,040	....	2,000
13	....	600	....	240	....	280	....	210	....	1,040	....	2,000
14	....	400	....	240	....	280	....	210	....	1,040	....	1,700
15	....	370	....	240	....	280	....	220	....	1,040	....	1,570
16	....	370	....	240	....	280	....	240	....	1,100	....	1,300
17	....	370	....	240	....	240	....	240	....	1,100	....	1,400
18	....	370	....	240	....	240	....	210	....	1,100	....	1,300
19	....	370	....	240	....	240	....	210	....	1,100	....	1,200
20	....	370	....	240	....	240	....	1,500	....	1,100	....	1,100
21	....	370	....	240	....	240	....	2,600	....	1,100	....	1,120
22	....	370	....	240	....	240	....	2,280	....	1,100	....	1,090
23	....	370	....	240	....	240	....	2,280	....	1,100	....	1,090
24	....	370	....	240	....	240	....	2,280	....	1,040	....	1,100
25	....	370	....	240	....	240	....	2,400	....	1,040	....	1,000
26	....	370	....	240	....	240	....	2,700	....	1,040	....	1,000
27	....	370	....	240	....	240	....	3,800	....	1,100	....	1,000
28	....	370	....	240	....	240	....	3,800	....	1,100	....	1,000
29	....	370	....	240	....	240	....	3,800	....	1,100	....	1,000
30	....	370	....	240	....	210	....	3,800	....	1,100	....	1,000
31	....	300	....	240	....	....	....	3,500	....	....	....	1,200

Monthly Discharge of Puntledge River at Diversion Dam for 1915.

(Drainage area, 175 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,080	400	639	3.65	4.21	39,300
February	1,200	460	710	4.05	4.22	39,400
March	2,600	530	1,360	7.76	8.95	83,600
April	2,500	720	1,600	9.15	10.21	95,200
May	1,250	800	1,100	6.29	7.25	67,600
June	1,250	1,000	1,100	6.29	7.02	65,500
July	1,100	300	608	3.48	4.01	37,400
August	280	240	250	1.43	1.65	15,400
September	280	210	252	1.44	1.61	15,000
October	3,800	210	1,260	7.20	8.30	77,500
November	3,500	1,040	1,490	8.52	9.51	88,700
December	2,380	1,000	1,450	8.28	9.55	89,200
The year	3,800	210	984	5.63	76.49	713,800

Note.—This data was supplied by the Canadian Collieries Co. (Dunsmuir) Ltd.

SHAWNIGAN CREEK.—(1025).

Location.—Five hundred feet from outlet of Shawnigan lake. Upstream side of Esquimalt and Nanaimo Railway bridge.

Records Available.—Daily discharges May 11, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—Twenty-two square miles.

Gauge.—Nine foot enamel staff, nailed to piling on left downstream side of highway bridge at outlet from lake. Gauge read daily by Mr. G. B. Aitkens.

Channel.—Straight for 50 feet on either side of section, gravel and sand bed.

Discharge Measurements.—Four in 1914, three in 1915, covering all stages.

Winter Flow.—Open all year.

Accuracy.—"A" (up to discharge of 280 cubic feet per second). "B" (above 280 cubic feet per second).

Discharge Measurements of Shawnigan Creek at Shawnigan Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 22	Cline & Webb	1,933	20	44.8	0.90	2.20	41.1
Aug. 27	H. C. Hughes					0.23	0.0[1]
Dec. 7	C. E. Webb	1,057	33	104.0	2.58	4.59	268.0

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[1] No flow.

Daily Gauge Height and Discharge of Shawnigan Creek at Shawnigan Lake for 1915.

(Drainage area, 22 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.3	52	2.6	73	2.35	55	2.2	46	1.85	28	1.5	14
2	2.35	55	2.6	73	2.3	52	2.3	52	1.85	28	1.5	14
3	2.40	58	2.6	73	2.3	52	2.35	55	1.8	26	1.5	14
4	2.4	58	2.6	73	2.3	52	2.4	58	1.75	24	1.45	12
5	2.4	58	2.6	73	2.3	52	2.4	58	1.75	24	1.45	13
6	2.45	62	2.65	77	2.3	52	2.4	58	1.7	22	1.4	11
7	2.5	65	2.7	81	2.3	52	2.4	58	1.7	22	1.4	11
8	2.65	77	2.8	89	2.3	52	2.4	58	1.65	20	1.4	11
9	2.75	85	2.8	89	2.3	52	2.4	58	1.65	20	1.4	11
10	2.9	97	2.7	81	2.25	49	2.4	58	1.65	20	1.35	10
11	3.2	125	2.75	85	2.25	49	2.4	58	1.6	18	1.35	10
12	3.4	145	2.75	85	2.2	46	2.35	55	1.6	18	1.3	9
13	3.5	155	2.7	81	2.2	46	2.35	55	1.6	18	1.3	9
14	3.6	165	2.7	81	2.2	46	2.3	52	1.6	18	1.3	9
15	3.6	165	2.65	77	2.2	46	2.25	49	1.6	18	1.3	9
16	3.6	165	2.65	77	2.2	46	2.25	49	1.6	18	1.3	9
17	3.55	160	2.6	73	2.25	49	2.2	46	1.6	18	1.3	9
18	3.5	155	2.6	73	2.25	49	2.2	46	1.6	18	1.25	8
19	3.4	145	2.55	69	2.2	46	2.15	43	1.6	18	1.28	9
20	3.3	135	2.5	65	2.2	46	2.15	43	1.6	18	1.2	7
21	3.25	130	2.5	65	2.2	46	2.1	40	1.6	18	1.2	7
22	3.2	125	2.5	65	2.2	46	2.1	40	1.6	18	1.2	7
23	3.1	115	2.5	65	2.15	43	2.05	37	1.6	18	1.2	7
24	3.05	110	2.45	62	2.15	43	2.0	34	1.6	18	1.2	7
25	3.0	105	2.4	58	2.1	40	1.95	32	1.6	18	1.2	7
26	2.9	97	2.4	58	2.1	40	1.9	30	1.55	16	1.2	7
27	2.85	93	2.4	58	2.1	40	1.85	28	1.55	16	1.15	6
28	2.8	89	2.35	55	2.05	37	1.85	28	1.55	16	1.15	6
29	2.7	81	....	....	2.05	37	1.85	28	1.50	14	1.15	6
30	2.65	77	....	....	2.05	37	1.85	28	1.50	14	1.15	6
31	2.6	73	....	....	2.1	40	....	....	1.50	14	....	....

	July.		August.		September.		October.		November.		December.	
1	1.10	5.0	0.85	2.2	0.20	0.1	0.0	0.0	1.3	9	4.45	257
2	1.10	5.0	0.85	2.3	0.15	0.1	0.0	0.0	1.4	11	4.40	250
3	1.10	5.0	0.80	2.0	0.15	0.1	0.0	0.0	1.45	12	4.20	230
4	1.10	5.0	0.80	2.0	0.10	0.0	0.0	0.0	1.50	14	4.10	220
5	1.10	5.0	0.80	2.0	0.10	0.0	0.0	0.0	1.55	16	4.10	220
6	1.05	4.0	0.80	2.0	0.10	0.0	0.0	0.0	1.55	16	4.4	250
7	1.05	4.0	0.75	1.7	0.10	0.0	0.0	0.0	1.60	18	4.6	275
8	1.05	4.0	0.75	1.8	0.10	0.0	0.0	0.0	1.60	18	5.3	350
9	1.05	4.0	0.75	1.7	0.10	0.0	0.0	0.0	1.60	18	5.5	375
10	1.00	3.0	0.70	1.5	0.10	0.0	0.0	0.0	1.60	18	5.4	360
11	1.00	3.0	0.70	1.5	0.05	0.0	0.0	0.0	1.65	20	5.2	340
12	1.00	3.0	0.70	1.5	0.05	0.0	0.0	0.0	1.65	20	5.0	320
13	1.00	3.0	0.65	1.2	0.05	0.0	0.0	0.0	1.70	22	4.9	305
14	1.00	3.0	0.65	1.3	0.0	0.0	0.0	0.0	1.70	22	4.7	285
15	1.00	3.0	0.60	1.0	0.0	0.0	0.0	0.0	1.75	24	4.5	265
16	1.00	3.0	0.60	1.0	0.0	0.0	0.0	0.0	1.80	26	4.4	250
17	1.00	3.0	0.55	0.8	0.0	0.0	0.0	0.0	2.00	34	4.2	230
18	0.95	2.7	0.55	0.8	0.0	0.0	0.0	0.0	2.20	46	4.1	220
19	0.95	2.8	0.50	0.6	0.0	0.0	0.0	0.0	2.40	58	4.1	220
20	0.95	2.7	0.50	0.6	0.0	0.0	0.0	0.0	2.60	73	4.2	230
21	0.95	2.8	0.40	0.3	0.0	0.0	0.05	0.0	2.70	81	5.4	360
22	0.95	2.7	0.40	0.3	0.0	0.0	0.10	0.0	2.90	97	5.8	405
23	0.95	2.8	0.35	0.3	0.0	0.0	0.15	0.0	3.10	115	5.7	395
24	0.90	2.5	0.35	0.2	0.0	0.0	0.2	0.1	3.30	135	5.5	375
25	0.90	2.5	0.30	0.2	0.0	0.0	0.3	0.2	3.60	165	5.30	350
26	0.90	2.5	0.30	0.2	0.0	0.0	0.5	0.6	3.90	195	5.1	330
27	0.90	2.5	0.25	0.2	0.0	0.0	0.6	1.0	4.20	230	4.8	295
28	0.90	2.5	0.25	0.1	0.0	0.0	0.8	2.0	4.20	230	4.9	305
29	0.90	2.5	0.20	0.1	0.0	0.0	0.85	2.2	4.40	250	4.7	285
30	0.85	2.2	0.20	0.1	0.0	0.0	0.90	2.5	4.50	265	4.6	275
31	0.85	2.3	0.15	0.1	....	....	1.10	5.0	....	....	4.4	250

Monthly Discharge of Shawnigan River at Shawnigan Lake for 1915.

(Drainage area, 22 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	165.0	52.0	106.00	4.82	5.56	6,520.0
February	89.0	55.0	73.00	3.32	3.46	4,050.0
March	55.0	37.0	46.00	2.09	2.41	2,830.0
April	58.0	28.0	46.00	2.09	2.33	2,740.0
May	28.0	14.0	19.00	0.86	0.99	1,170.0
June	14.0	6.0	9.00	0.41	0.46	536.0
July	5.0	2.2	3.26	0.15	0.17	200.0
August	2.3	0.1	1.02	0.05	0.06	62.7
September	0.1	0.0	0.01	0.00	0.00	6.0
October	5.0	0.0	0.44	0.02	0.02	27.0
November	265.0	9.0	75.30	3.43	3.83	4,480.0
December	405.0	220.0	293.00	13.30	15.30	18,000.0
The year	405.0	0.0	56.00	2.55	34.59	40,621.7

SPROAT RIVER.—(1051).

Location.—Eight hundred feet below outlet from Sproat lake, 8 miles from Alberni.

Records Available.—Daily discharges March 1, 1913, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—One hundred and twenty-eight square miles.

Gauge.—Twelve-foot wooden staff nailed to crib on lake shore, 300 feet to right of outlet. Gauge read daily by Mr. H. Weiner.

Channel.—Slight curve at section, straight for 500 feet above and below section, gravel and boulder bed, solid rock on left side, good control.

Discharge Measurements.—Six in 1913, by Provincial Water Rights Branch, four in 1914, and two in 1915.

Winter Flow.—Open all year.

Accuracy.—"A" (up to discharge of 2,500 cubic feet per second). "B" (between discharge of 2,500 and 6,000 cubic feet per second). "C" (above 6,000 cubic feet per second).

Co-operation.—Provincial Water Rights Branch established station in 1913.

Discharge Measurements of Sproat River at Sproat Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 17	Milner & Webb	1,933	134	744	3.31	6.50	2,460
Sept. 7	H. C. Hughes	1,505	80	105	0.94	1.15	100

Daily Gauge Height and Discharge of Sproat River at Sproat Lake for 1915.

(Drainage area, 128 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	4.10	1,000	3.75	860	5.10	1,540	6.23	2,260	4.47	1,190	3.90	920
2	4.69	1,300	3.98	950	5.00	1,480	7.65	3,520	4.33	1,110	3.86	900
3	4.92	1,430	4.15	1,030	4.90	1,420	8.20	4,120	3.29	1,100	3.82	890
4	5.00	1,480	4.20	1,050	4.88	1,410	8.15	4,070	4.25	1,080	3.78	870
5	5.07	1,520	4.20	1,050	4.85	1,390	7.90	3,790	4.23	1,060	3.75	860
6	5.16	1,580	4.35	1,130	4.88	1,410	7.50	3,370	4.19	1,050	3.68	830
7	5.27	1,640	4.70	1,300	4.80	1,360	7.30	3,180	4.15	1,030	3.64	820
8	5.30	1,660	4.80	1,360	4.75	1,330	7.20	3,090	4.13	1,020	3.60	800
9	5.43	1,740	4.88	1,410	4.69	1,290	7.10	3,000	4.10	1,000	3.55	780
10	5.55	1,810	4.95	1,450	4.63	1,270	7.00	2,910	4.31	1,110	3.50	760
11	6.37	2,380	5.00	1,480	4.59	1,250	6.90	2,820	4.45	1,170	3.45	740
12	6.55	2,520	5.10	1,540	4.45	1,180	6.80	2,730	4.60	1,250	3.40	720
13	6.45	2,440	5.20	1,600	4.38	1,140	6.86	2,780	4.60	1,250	3.35	710
14	6.32	2,340	5.20	1,600	4.92	1,430	7.00	2,910	4.55	1,230	3.30	690
15	6.10	2,170	5.25	1,630	5.68	1,890	6.85	2,780	4.50	1,200	3.25	680
16	5.90	2,030	5.29	1,650	6.05	2,140	6.70	2,640	4.43	1,170	3.18	650
17	5.58	1,830	5.30	1,660	6.68	2,620	6.50	2,480	4.39	1,150	3.13	640
18	5.40	1,720	5.30	1,660	7.15	3,050	6.38	2,380	4.36	1,130	3.08	620
19	5.25	1,630	5.21	1,610	7.10	3,000	6.21	2,250	4.30	1,100	3.04	610
20	5.12	1,550	5.10	1,540	7.00	2,910	6.04	2,130	4.23	1,060	3.00	600
21	5.00	1,480	5.00	1,480	6.95	2,870	5.87	2,010	4.15	1,030	2.95	590
22	4.85	1,390	4.95	1,450	6.89	2,810	5.67	1,880	4.11	1,010	2.91	570
23	4.70	1,300	4.98	1,470	6.80	2,730	5.48	1,770	4.10	1,000	2.86	560
24	4.55	1,230	5.00	1,480	6.60	2,660	5.31	1,670	4.12	1,010	2.82	550
25	4.40	1,150	5.15	1,570	6.40	2,400	5.15	1,570	4.13	1,010	2.78	530
26	4.28	1,090	5.18	1,590	6.20	2,240	5.00	1,480	....	1,020	2.74	520
27	4.15	1,030	5.20	1,600	6.00	2,100	4.92	1,430	4.15	1,030	2.69	510
28	4.00	960	5.15	1,570	5.85	2,000	4.75	1,330	4.15	1,030	2.65	500
29	3.90	920	....	....	5.76	1,940	4.65	1,280	4.16	1,030	2.60	480
30	3.82	890	....	....	5.65	1,870	4.55	1,220	4.05	980	2.55	470
31	3.79	880	....	....	5.60	1,840	....	....	3.95	940	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	2.50	450	1.78	245	1.22	135	1.05	100	9.25	5,280	5.65	1,870
2	2.49	445	1.76	240	1.23	135	1.38	165	8.90	4,990	5.68	1,890
3	....	445	1.73	235	1.21	130	1.42	175	8.45	4,400	6.97	2,880
4	2.48	445	1.70	230	1.21	130	1.44	180	8.05	3,950	7.55	3,420
5	2.45	435	1.67	225	1.21	130	1.46	180	7.65	3,520	8.01	3,910
6	2.41	425	1.64	220	1.20	130	1.46	180	7.35	2,230	8.04	3,940
7	2.39	415	1.61	210	1.20	130	1.45	180	7.10	3,000	7.90	3,790
8	2.35	405	1.58	205	1.19	130	1.43	175	6.80	2,730	7.70	3,570
9	2.32	395	1.57	205	1.18	125	1.39	170	6.50	2,480	7.50	3,370
10	2.31	395	....	200	1.16	120	1.40	170	6.22	2,260	7.30	3,180
11	2.30	390	1.55	200	1.15	120	1.45	180	6.10	2,170	7.10	3,000
12	2.29	385	1.53	195	1.13	115	1.49	180	5.62	1,850	7.30	3,180
13	2.28	385	1.51	190	1.12	115	1.58	205	5.35	1,690	7.20	3,090
14	2.25	375	1.49	190	1.10	110	1.65	220	5.30	1,660	7.00	2,910
15	2.23	370	1.47	185	1.09	110	1.70	230	5.28	1,650	6.75	2,680
16	2.20	360	1.45	180	1.07	105	1.71	230	5.35	1,690	6.40	2,400
17	2.16	350	1.44	180	1.06	100	1.72	235	5.55	1,810	6.25	2,280
18	2.12	335	1.43	175	1.04	100	1.75	240	5.50	1,780	6.18	2,230
19	2.08	325	1.42	175	1.03	95	1.90	270	5.45	1,750	6.50	2,480
20	2.04	310	1.41	170	1.01	90	2.50	450	5.42	1,730	6.80	2,730
21	2.00	300	1.40	170	0.99	90	4.22	1,060	5.41	1,730	7.05	2,960
22	1.96	290	1.39	170	0.99	90	5.20	1,600	5.48	1,770	6.95	2,860
23	1.93	280	1.38	165	0.98	85	5.45	1,750	5.51	1,790	6.84	2,770
24	1.90	270	1.37	165	0.98	85	5.58	1,830	5.50	1,780	6.72	2,660
25	1.88	265	1.36	160	0.98	85	5.85	2,000	5.48	1,770	6.62	2,580
26	1.86	260	1.35	160	0.97	85	6.21	2,250	5.50	1,780	6.51	2,490
27	1.85	260	1.30	150	0.99	90	7.80	3,680	5.55	1,810	6.40	2,400
28	1.84	260	1.25	140	0.98	85	9.31	5,350	5.58	1,830	6.65	2,600
29	1.82	255	1.23	135	0.98	85	9.15	5,170	5.60	1,840	6.92	2,840
30	1.80	250	1.23	135	1.00	90	8.90	4,990	5.63	1,860	6.12	2,180
31	1.79	250	1.22	135	....	....	9.45	5,520	..		5.38	1,710

Monthly Discharge of Sproat River at Sproat Lake for 1915.

(Drainage area, 128 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	2,520	880	1,550	12.10	13.95	95,300
February	1,660	860	1,420	11.10	11.56	78,900
March	3,050	1,140	1,930	15.07	17.37	119,000
April	4,120	1,220	2,490	19.45	21.70	148,000
May	1,250	940	1,080	8.44	9.73	66,400
June	920	470	680	5.31	5.92	40,500
July	450	250	348	2.72	3.14	21,400
August	245	135	185	1.45	1.67	11,400
September	135	85	108	0.84	0.94	6,430
October	5,520	100	1,270	9.93	11.45	78,100
November	5,280	1,650	2,390	18.70	20.90	142,000
December	3,940	1,710	2,800	21.90	25.20	172,000
The year	5,520	85	1,350	10.60	143.53	979,430

STAMP RIVER AT GREAT CENTRAL LAKE.—(1052).

Location.—Three hundred feet below outlet from Great Central lake, 16 miles from Alberni.

Records Available.—Daily discharges February 20, 1913, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—One hundred and seventy-seven square miles.

Gauge.—Twelve-foot wooden staff nailed to crib in lake, 300 feet to right of outlet. Gauge read twice daily by Mr. J. Drinkwater.

Channel.—Straight for 300 feet above and 100 feet below section, rocky bed, some boulders. At extreme high water stage there is a discharge from slough 1,000 feet to right of stream.

Discharge Measurements.—Seven in 1913, by Provincial Water Rights Branch; four in 1914, and two in 1915, covering all but highest stage.

Winter Flow.—Open all year.

Accuracy.—"A" (between discharge of 250 and 3,500 cubic feet per second). "B" (below 250 and between 3,500 and 5,000 cubic feet per second). "C" (above 5,000 cubic feet per second).

Co-operation.—Station established in 1913 by Provincial Water Rights Branch.

Discharge Measurements of Stamp River at Great Central Lake for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 17	Milner & Webb	1,933	141	827	3.36	5.00	2,780
Sept. 7	H. C. Hughes	1,505	100	310	0.93	0.92	248

Daily Gauge Height and Discharge of Stamp River at Great Central Lake for 1915.

(Drainage area, 177 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.47	980	2.18	820	3.34	1,530	5.03	2,790	3.38	1,560	3.29	1,490
2	2.88	1,230	2.35	910	3.33	1,520	6.35	4,000	3.28	1,490	3.24	1,460
3	3.00	1,300	2.44	960	3.27	1,480	6.82	4,500	3.27	1,480	3.16	1,400
4	3.04	1,320	2.49	990	3.24	1,460	6.74	4,410	3.26	1,470	3.10	1,360
5	3.01	1,310	2.58	1,050	3.16	1,400	6.54	4,190	3.28	1,490	3.06	1,340
6	2.99	1,290	2.72	1,130	3.19	1,420	6.25	3,900	3.30	1,500	3.06	1,340
7	3.06	1,340	2.88	1,230	3.22	1,440	6.00	3,660	3.37	1,550	3.08	1,350
8	3.17	1,410	3.12	1,370	3.14	1,390	6.01	3,670	3.40	1,570	3.10	1,360
9	3.19	1,420	3.36	1,540	2.99	1,290	5.92	3,590	3.41	1,580	3.08	1,350
10	3.36	1,540	3.53	1,660	2.94	1,260	5.67	3,360	3.56	1,680	3.05	1,330
11	3.69	1,770	3.57	1,690	2.87	1,220	5.54	3,250	3.94	1,950	2.99	1,290
12	3.78	1,830	3.57	1,690	2.83	1,200	5.55	3,260	4.06	2,030	2.93	1,260
13	3.74	1,810	3.48	1,630	2.80	1,180	5.68	3,370	4.02	2,000	2.87	1,220
14	3.69	1,770	3.38	1,560	2.98	1,280	5.60	3,300	3.99	1,980	2.85	1,210
15	3.57	1,690	3.44	1,600	3.96	1,960	5.42	3,140	3.93	1,940	2.81	1,190
16	3.46	1,610	3.39	1,560	4.34	2,240	5.15	2,900	3.82	1,860	2.78	1,170
17	3.34	1,530	3.41	1,580	4.98	2,750	5.02	2,790	3.75	1,820	2.76	1,160
18	3.20	1,430	3.39	1,560	5.56	3,260	4.99	2,760	3.68	1,770	2.72	1,130
19	3.10	1,360	3.33	1,520	5.68	3,370	4.94	2,720	3.61	1,720	2.69	1,110
20	2.99	1,290	3.26	1,470	5.52	3,230	4.84	2,640	3.57	1,690	2.61	1,070
21	2.89	1,230	3.13	1,380	5.50	3,210	4.72	2,550	3.54	1,670	2.58	1,050
22	2.74	1,140	3.10	1,360	5.48	3,190	4.56	2,420	3.49	1,630	2.52	1,010
23	2.68	1,110	3.16	1,400	5.45	3,170	4.39	2,280	3.47	1,620	2.46	980
24	2.59	1,050	3.19	1,420	5.38	3,100	4.31	2,220	3.40	1,570	2.48	990
25	2.48	990	3.47	1,620	5.34	2,980	4.16	2,100	3.38	1,560	2.47	980
26	2.32	890	3.43	1,590	5.03	2,790	4.01	2,000	3.36	1,540	2.44	960
27	2.28	870	3.48	1,630	4.82	2,630	3.88	1,900	3.43	1,590	2.38	930
28	2.22	840	3.49	1,630	4.67	2,510	3.78	1,840	3.51	1,650	2.33	900
29	2.19	830	....	....	4.45	2,330	3.61	1,720	3.51	1,650	2.24	850
30	2.11	780	....	....	4.38	2,270	3.52	1,650	3.43	1,590	2.19	830
31	2.08	770	....	....	4.47	2,350	....	....	3.35	1,540	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	2.18	820	1.48	480	0.80	240	0.68	205	7.90	5,820	3.73	1,800
2	2.17	815	1.43	460	0.80	240	0.81	245	7.52	5,330	3.89	1,910
3	2.15	805	1.39	445	0.80	240	0.86	260	7.08	4,800	4.78	2,590
4	2.13	795	1.37	440	0.80	240	1.11	335	6.61	4,270	5.31	3,040
5	2.10	780	1.37	440	0.80	240	1.30	410	6.27	3,920	5.61	3,310
6	2.13	795	1.38	440	0.79	240	1.13	340	5.92	3,590	5.87	3,540
7	2.09	775	1.32	420	0.84	250	1.10	330	5.53	3,240	5.74	3,430
8	2.09	775	1.31	415	0.80	240	1.06	320	5.24	2,980	5.75	3,440
9	2.09	775	1.29	405	0.88	265	1.02	305	4.95	2,730	5.52	3,230
10	2.07	765	1.23	380	0.88	265	1.01	305	4.67	2,510	5.32	3,050
11	2.06	760	1.22	380	0.81	245	0.95	285	4.47	2,350	5.11	2,860
12	2.06	760	1.20	370	0.80	240	1.08	325	4.23	2,150	5.01	2,780
13	2.02	740	1.19	365	0.88	265	1.18	360	4.01	2,000	4.96	2,740
14	1.99	725	1.14	345	0.88	265	1.27	400	3.84	1,880	4.79	2,600
15	1.96	710	1.12	340	0.70	210	1.28	400	3.80	1,850	4.63	2,470
16	1.90	680	1.10	330	0.70	210	1.28	400	3.75	1,820	4.39	2,280
17	1.87	665	1.09	330	0.70	210	1.30	410	3.74	1,810	4.22	2,150
18	1.80	630	1.08	325	0.70	210	1.35	430	3.85	1,890	4.15	2,100
19	1.79	625	1.06	320	0.70	210	1.44	465	3.77	1,830	4.00	1,990
20	1.76	610	1.06	320	0.70	210	1.98	720	3.68	1,770	4.19	2,120
21	1.74	600	1.06	320	0.68	205	3.79	1,840	3.56	1,680	4.39	2,280
22	1.70	580	1.02	305	0.66	200	4.52	2,390	3.53	1,660	4.55	2,410
23	1.68	570	1.00	300	0.64	190	4.88	2,670	3.65	1,750	4.50	2,370
24	1.63	545	0.98	295	0.64	190	4.99	2,760	3.59	1,700	4.42	2,310
25	1.60	530	0.96	290	0.60	180	5.16	2,900	3.82	1,860	4.30	2,210
26	1.56	515	0.94	280	0.60	180	5.93	3,600	4.16	2,100	4.15	2,100
27	1.55	510	0.94	280	0.60	180	6.94	4,630	3.97	1,970	4.11	2,070
28	1.56	515	0.92	275	0.60	180	8.29	6,360	4.06	2,030	3.94	1,950
29	1.52	500	0.90	270	0.60	180	8.10	6,090	3.94	1,950	3.81	1,860
30	1.55	510	0.84	250	0.62	185	7.77	5,650	3.87	1,900	3.49	1,630
31	1.49	485	0.80	240	....	....	7.97	5,910	....	....	3.44	1,600

Monthly Discharge of Stamp River at Great Central Lake for 1915.

(Drainage area, 177 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,830	770	1,280	7.23	8.33	78,700
February	1,690	820	1,410	7.96	8.29	78,300
March	3,370	1,180	2,140	12.09	13.93	132,000
April	4,500	1,650	2,960	16.72	18.65	176,000
May	2,030	1,470	1,670	9.43	10.87	103,000
June	1,490	830	1,170	6.61	7.37	69,600
July	820	485	677	3.82	4.40	41,600
August	480	240	350	1.98	2.28	21,500
September	265	180	220	1.24	1.38	13,100
October	6,360	205	1,680	9.49	10.90	103,000
November	5,820	1,660	2,570	14.50	16.20	153,000
December	3,540	1,600	2,460	13.90	16.00	151,000
The year	6,360	180	1,550	8.75	118.60	1,120,800

STAMP RIVER AT STAMP FALLS.—(1053).

Location.—One-quarter mile above falls, 8 miles from Alberni, on Beaver Creek road.

Records Available.—Daily discharges March, 1913, to May 31, 1914. Messrs. Ritchie Agnew, engineers, Victoria, B.C. Daily discharges June 1, 1914, to December 31, 1915. (Records for 1915 are given herein; preceding records are tabulated in previous reports.)

Drainage Area.—Three hundred and thirty-six square miles.

Gauge.—Fourteen-foot wooden staff on left bank, 80 feet below measuring section. Gauge read daily by Mr. Robt. Darby.

Channel.—Straight for 600 feet above and 300 feet below section. Rock bed with gravel, good condition.

Discharge Measurements.—Numerous measurements made by Messrs. Ritchie Agnew Co., during 1913 and 1914, three in 1914 and one in 1915, covering all stages.

Winter Flow.—Open all year.

Accuracy.—"B".

Co-operation.—Station established in 1913 by Messrs. Ritchie Agnew Co.

Discharge Measurements of Stamp River near Stamp Falls for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Sept. 8	H. C. Hughes	1,505	140	810	0.47	0.31	384

Daily Gauge Height and Discharge of Stamp River at Falls for 1915.

(Drainage area, 336 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.5	2,340	1.5	1,130	2.7	2,680	4.1	5,800	3.1	3,390	2.0	1,670
2	2.6	2,510	1.5	1,130	2.5	2,340	5.3	10,400	3.1	3,390	2.1	1,800
3	3.0	3,190	1.5	1,130	2.5	2,340	5.0	9,120	2.8	2,850	2.1	1,800
4	3.4	4,020	1.8	1,450	2.5	2,340	4.6	7,540	2.6	2,510	2.1	1,890
5	3.5	4,240	2.0	1,670	2.3	2,060	4.4	6,790	2.6	2,510	2.1	1,800
6	3.5	4,240	2.0	1,670	2.3	2,060	4.0	5,530	2.4	2,200	2.1	1,800
7	3.7	4,750	2.4	2,200	2.2	1,930	4.0	5,530	2.4	2,200	2.0	1,670
8	3.4	4,020	2.4	2,200	2.2	1,930	3.7	4,750	2.4	2,200	2.0	1,670
9	3.1	3,390	2.8	2,850	2.2	1,930	3.7	4,750	2.4	2,200	2.0	1,670
10	2.9	3,020	3.3	3,800	2.1	1,800	3.5	4,240	2.4	2,200	1.9	1,560
11	4.2	6,100	2.9	3,020	2.1	1,800	3.5	4,240	2.3	2,060	1.9	1,560
12	3.8	5,010	2.7	2,680	2.1	1,800	3.1	3,390	2.3	2,060	1.9	1,560
13	2.9	3,020	2.4	2,200	2.0	1,670	3.1	3,390	2.4	2,200	1.8	1,450
14	2.6	2,510	2.4	2,200	2.0	1,670	3.7	4,750	2.4	2,200	1.8	1,460
15	2.4	2,200	2.4	2,200	3.0	3,190	3.3	3,800	2.4	2,200	1.9	1,450
16	2.4	2,200	2.3	2,060	4.2	6,100	3.3	3,800	2.4	2,200	1.8	1,450
17	2.2	1,930	2.3	2,060	5.4	10,800	3.1	3,390	2.3	2,060	1.8	1,450
18	2.2	1,930	2.3	2,060	5.0	9,120	3.4	4,020	2.3	2,060	1.6	1,230
19	2.2	1,930	2.2	1,930	4.8	8,320	3.0	3,190	2.3	2,060	1.6	1,230
20	1.9	1,560	2.2	1,930	3.9	5,270	3.0	3,190	2.2	1,930	1.6	1,230
21	1.8	1,450	2.2	1,930	3.8	5,010	2.8	2,850	2.2	1,930	1.6	1,230
22	1.8	1,450	2.4	2,200	3.8	5,010	2.6	2,510	2.2	1,930	1.6	1,230
23	1.6	1,230	2.4	2,200	3.4	4,020	2.6	2,510	2.2	1,930	1.4	1,040
24	1.6	1,230	2.4	2,200	3.2	3,590	2.4	2,200	2.2	1,930	1.4	1,040
25	1.5	1,130	2.5	2,340	3.2	3,590	2.4	2,200	2.1	1,800	1.4	1,040
26	1.5	1,130	2.5	2,340	3.0	3,190	2.4	2,200	2.1	1,800	1.4	1,040
27	1.4	1,040	2.6	2,510	3.0	3,190	2.6	2,510	2.1	1,800	1.4	1,040
28	1.4	1,040	2.6	2,510	2.8	2,850	2.8	2,850	2.1	1,800	1.4	1,040
29	1.3	960	....	....	2.8	2,850	3.0	3,190	2.1	1,800	1.4	1,040
30	1.3	960	....	....	2.8	2,850	3.1	3,390	2.0	1,670	1.3	960
31	1.3	960	....	....	3.0	3,190	....	....	2.0	1,670	....	....

	July.		August.		September.		October.		November.		December.	
1	1.3	960	0.7	560	0.3	370	0.6	510	5.3	10,400	3.3	3,800
2	1.3	960	0.7	560	0.3	370	0.7	560	4.9	8,720	4.3	6,430
3	1.3	960	0.7	560	0.3	370	0.6	510	4.3	6,430	5.0	9,120
4	1.3	960	0.7	560	0.2	340	0.7	560	4.0	5,530	5.1	9,520
5	1.2	880	0.7	560	0.2	340	0.7	560	3.9	5,270	4.9	8,720
6	1.2	880	0.6	510	0.2	340	0.5	460	3.8	5,010	4.7	7,920
7	1.2	880	0.6	510	0.1	320	0.5	460	3.4	4,020	4.5	7,160
8	1.2	880	0.6	510	0.1	320	0.4	410	3.0	3,190	4.5	7,160
9	1.2	880	0.6	510	0.1	320	0.4	410	2.9	3,020	4.1	5,800
10	1.1	800	0.6	510	0.1	320	0.3	370	2.7	2,680	4.0	5,530
11	1.1	800	0.5	460	0.1	320	0.3	370	2.7	2,680	4.0	5,530
12	1.1	800	0.5	460	0.1	320	0.3	370	2.7	2,680	3.8	5,010
13	1.1	800	0.5	460	0.1	320	0.3	370	2.6	2,510	3.2	3,590
14	1.1	800	0.5	460	0.1	320	0.4	410	2.4	2,200	3.2	3,590
15	1.1	800	0.5	460	0.1	320	0.6	510	2.8	2,850	3.1	3,390
16	1.1	800	0.5	460	0.1	320	1.0	720	2.9	3,020	3.0	3,190
17	1.1	800	0.5	460	0.1	320	1.0	720	3.0	3,190	2.8	2,850
18	1.1	800	0.5	460	0.1	320	1.6	1,230	2.9	3,020	2.7	2,680
19	1.1	800	0.5	460	0.0	300	2.0	1,670	2.7	2,680	4.3	6,430
20	1.0	720	0.5	460	0.0	300	3.9	5,270	2.7	2,680	6.2	14,200
21	1.0	720	0.5	460	0.0	300	4.0	5,530	2.7	2,680	4.0	5,530
22	1.0	720	0.4	410	0.0	300	4.1	5,800	2.9	3,020	3.6	4,490
23	1.0	720	0.4	410	0.0	300	4.1	5,800	2.9	3,020	3.4	4,020
24	0.9	660	0.4	410	0.0	300	4.1	5,800	2.9	3,020	2.8	2,850
25	0.9	660	0.3	370	0.0	300	4.9	8,720	2.8	2,850	2.6	2,510
26	0.8	610	0.3	370	0.0	300	5.4	10,800	2.8	2,850	2.6	2,510
27	0.8	610	0.3	370	0.0	300	5.7	12,100	2.8	2,850	2.4	2,200
28	0.8	610	0.3	370	0.0	300	7.2	19,000	2.8	2,850	2.4	2,200
29	0.8	610	0.3	370	0.0	300	5.8	12,500	2.8	2,850	2.2	1,930
30	0.8	610	0.3	370	0.0	300	5.6	11,700	3.0	3,190	2.2	1,930
31	0.7	560	0.3	370	....	....	5.5	11,300			2.2	1,930

Monthly Discharge of Stamp River at Stamp Falls for 1915.

(Drainage area, 336 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	6,100	960	2,470	7.35	8.47	152,000
February	3,800	1,130	2,140	6.37	6.63	119,000
March	10,800	1,670	3,560	10.60	12.22	219,000
April	10,400	2,200	4,270	12.70	14.17	254,000
May	3,390	1,670	2,150	6.40	7.38	132,000
June	1,800	960	1,400	4.17	4.65	83,300
July	960	560	776	2.31	2.66	47,700
August	560	370	459	1.37	1.58	28,200
September	370	300	319	0.95	1.06	19,000
October	19,000	370	4,050	12.10	14.00	249,000
November	10,400	2,200	3,700	11.00	12.30	220,000
December	9,520	1,930	4,960	14.80	17.10	305,000
The year	19,000	300	2,521	7.51	102.22	1,828,200

TSOLUM RIVER.—(1039).

Location.—Upstream side of foot bridge, 2 miles from Sandwick.

Records Available.—Daily discharges May 31, 1914, to December 31, 1915. (Records for 1915 are given herein; those for 1914 are tabulated in a previous report.)

Drainage Area.—One hundred and fifty square miles.

Gauge.—Twelve foot enamel staff, 20 feet downstream from bridge, on cribbing, right bank. Gauge read twice daily by Mr. W. Calhoun.

Channel.—Straight for 500 feet above and 300 feet below section. Gravel bed. Stream confined by cribbing, both banks, in high water.

Discharge Measurements.—Four in 1914, and three in 1915.

Winter Flow.—Open all year.

Accuracy.—"B" (up to discharge of 900 cubic feet per second). "C" (above 900 cubic feet per second).

Discharge Measurements of Tsolum River 3 Miles above Mouth for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 21	Milner & Webb	1,933	65	131.0	1.40	5.83	181.0[1]
Sept. 26	H. C. Hughes	1,505	11	2.2	0.95	4.65	2.1[2]
Oct. 30	Webb & Balls	1,057	97	212.0	2.63	6.85	558.0

[1] Gauge lowered two feet.

[2] Not at regular section.

Daily Gauge Height and Discharge of Tsolum River 5 Miles from Mouth for 1915.

(Drainage area, 150 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	7.4	930	6.4	450	6.7	590	8.0	1,220	5.4	75	5.6	115
2	8.3	1,360	6.3	400	6.3	400	8.4	1,410	5.4	75	5.6	115
3	7.9	1,170	6.9	690	6.3	400	7.8	1,120	5.5	95	5.5	95
4	7.1	780	7.0	740	6.5	500	7.4	930	5.8	175	5.5	95
5	7.7	1,070	7.5	980	6.3	400	7.1	780	5.8	175	5.4	75
6	7.9	1,170	8.6	1,500	6.6	540	6.8	640	5.8	175	5.4	75
7	7.9	1,170	8.4	1,410	6.5	500	6.7	590	5.7	145	5.4	75
8	8.5	1,460	8.1	1,260	6.4	450	6.6	540	5.7	145	5.3	60
9	8.6	1,500	7.9	1,170	6.2	350	6.4	450	5.8	175	5.2	48
10	9.0	1,700	7.7	1,070	6.1	300	6.2	350	5.9	215	5.2	48
11	9.3	1,850	7.1	780	6.2	350	6.1	300	5.9	215	5.1	38
12	8.5	1,500	6.8	640	6.4	450	6.6	540	6.0	260	5.2	48
13	8.5	1,460	6.5	500	6.9	690	6.5	500	5.9	215	5.1	38
14	8.0	1,220	6.5	500	7.8	1,120	6.4	450	5.8	175	5.1	38
15	7.3	880	6.4	450	8.9	1,650	6.3	400	5.7	145	5.1	38
16	6.9	690	6.3	400	8.0	1,220	6.2	350	5.7	145	5.2	48
17	6.4	450	6.3	400	8.6	1,500	6.3	400	5.7	145	5.2	48
18	6.3	400	6.2	350	8.0	1,220	6.3	400	5.8	175	5.1	38
19	6.2	350	6.2	350	7.2	830	6.2	350	5.8	175	5.0	28
20	6.1	300	6.1	300	6.9	690	6.0	260	5.9	215	5.0	28
21	6.0	260	6.0	260	7.0	740	5.8	175	5.9	215	5.0	28
22	5.9	215	6.2	350	7.0	740	5.7	145	5.8	175	5.0	28
23	5.9	215	6.2	350	7.0	740	5.7	145	5.8	175	5.0	28
24	5.8	175	6.7	590	6.7	590	5.7	145	5.8	175	4.9	18
25	5.7	145	7.8	1,120	6.4	450	5.6	115	5.9	215	4.9	18
26	5.6	115	7.4	930	6.2	350	5.6	115	5.9	215	4.9	18
27	5.6	115	7.1	780	6.1	300	5.6	115	5.8	175	4.8	12
28	5.5	95	6.9	690	6.0	260	5.6	115	5.8	175	4.8	12
29	5.4	75	....	....	6.0	260	5.5	95	5.8	175	4.8	12
30	5.9	215	....	....	6.4	450	5.4	75	5.7	145	4.7	8
31	6.0	260	....	....	7.3	880	....	....	5.7	145	....	....

	July.		August.		September.		October.		November.		December.	
1	4.7	8	4.7	8	4.6	5	4.7	8	6.4	450	6.4	450
2	4.7	8	4.7	8	4.6	5	4.8	12	6.0	260	6.8	640
3	4.6	5	4.7	8	4.6	5	4.8	12	5.7	145	7.9	1,170
4	4.6	5	4.7	8	4.6	5	4.8	12	5.6	115	8.9	1,650
5	4.6	5	4.6	5	4.6	5	4.8	12	5.4	75	7.6	1,020
6	4.6	5	4.6	5	4.6	5	4.8	12	5.0	28	7.5	980
7	4.6	5	4.6	5	4.7	8	4.8	12	5.0	28	7.4	930
8	4.7	8	4.6	5	4.9	18	4.8	12	5.0	28	8.4	1,410
9	4.7	8	4.6	5	4.8	12	4.8	12	5.2	48	8.9	1,650
10	4.6	5	4.6	5	4.8	12	4.8	12	5.6	115	8.0	1,220
11	4.6	5	4.6	5	4.7	8	4.8	12	5.8	175	7.6	1,020
12	4.6	5	4.6	5	4.7	8	4.8	12	6.0	260	7.9	1,170
13	4.7	8	4.6	5	4.7	8	4.8	12	6.4	450	8.6	1,500
14	4.9	18	4.5	3	4.7	8	4.8	12	6.4	450	8.4	1,410
15	5.3	60	4.5	3	4.6	5	4.8	12	6.8	640	7.7	1,070
16	5.8	175	4.5	3	4.6	5	4.8	12	7.2	830	7.9	1,170
17	5.4	75	4.5	3	4.6	5	4.8	12	7.1	780	7.5	980
18	5.0	28	4.5	3	4.6	5	4.9	18	7.1	780	7.3	880
19	4.9	18	4.5	3	4.6	5	5.3	60	6.8	640	7.7	1,070
20	4.9	18	4.5	3	4.6	5	5.9	215	6.6	540	8.6	1,500
21	4.8	12	4.5	3	4.6	5	8.4	1,410	6.6	540	8.4	1,410
22	4.8	12	4.5	3	4.6	5	7.8	1,120	7.0	740	8.0	1,220
23	4.8	12	4.5	3	4.6	5	7.3	880	7.5	980	7.4	930
24	4.8	12	4.5	3	4.6	5	8.0	1,220	7.2	830	6.8	640
25	4.7	8	4.5	3	4.6	5	8.6	1,500	7.1	780	6.7	590
26	4.7	8	4.5	3	4.6	5	8.4	1,410	7.4	930	6.7	590
27	4.7	8	4.5	3	4.6	5	8.7	1,550	6.9	690	6.6	540
28	4.7	8	4.5	3	4.6	5	9.2	1,800	6.6	540	6.5	500
29	4.8	12	4.5	3	4.6	5	7.8	1,120	6.7	590	6.5	500
30	4.8	12	4.5	3	4.6	5	7.0	740	6.6	540	6.4	450
31	4.8	12	4.5	3	....	....	6.6	540	....	....	6.4	450

Monthly Discharge of Tsolum River 3 Miles from Mouth for 1915.

(Drainage area, 150 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,850	75	751.00	5.00	5.76	46,200
February	1,500	260	693.00	4.62	4.81	38,500
March	1,650	260	642.00	4.28	4.93	39,500
April	1,410	75	441.00	2.94	3.28	26,200
May	260	75	171.00	1.14	1.31	10,500
June	115	8	458.00	3.05	3.40	27,300
July	175	5	19.00	0.13	0.15	1,170
August	8	3	4.22	0.03	0.04	259
September	18	5	6.40	0.04	0.04	381
October	1,800	8	444.00	2.96	3.41	27,300
November	980	28	467.00	3.11	3.47	27,800
December	1,650	450	990.00	6.60	7.61	60,900
The year	1,850	3	424.00	2.83	38.21	306,010

MISCELLANEOUS METERING STATIONS.

SOUTHERN DISTRICT.

Date 1915.	Stream.	Tributary To	Locality.	Engineer	Gauge Heights.	Discharge.
					Feet	Sec.-ft.
April 29	Black	Howe sound	Howe sound	Hughes	2.32	66.2
April 30	Black	Howe sound	Howe sound	Hughes	2.05	47.5
July 29	Black	Howe sound	Howe sound	Hughes	0.78	2.4
July 10	Bridalveil	Coquihalla		Hughes		1.0
June 25	Capilano intake	Burrard inlet	North Vancouver	Cline		26.0
April 25	Dunville	Fraser river	Rosedale, B.C.	Cline	0.95	3.0
Nov. 23	Dunville	Fraser river	Rosedale, B.C.	Hughes & Webb	0.92	4.3
April 21	Elk above Jackman	Fraser river	Rosedale, B.C.	Cline	1.20	11.1
Nov. 23	Elk above Jackman	Fraser river	Rosedale, B.C.	Hughes & Webb	1.02	8.2
April 21	Elk water works intake	Fraser river	Rosedale, B.C.	Cline	0.70	13.9
Nov. 23	Elk water works intake	Fraser river	Rosedale, B.C.	Hughes & Webb	0.59	10.4
April 25	Hutchison	Dunville creek	Rosedale, B.C.	Hughes & Cline	3.65	7.8
Nov. 23	Hutchison	Dunville creek	Rosedale, B.C.	Hughes & Webb	3.62	4.7
April 21	Jackman	Elk creek	Rosedale, B.C.	Cline		3.7
Nov. 23	Jackman	Elk creek	Rosedale, B.C.	Hughes & Webb		3.3
July 3	Slollicum	Harrison river		Cline	0.96	6.2
June 10	Seymour intake (Upper)	Burrard inlet	North Vancouver	Cline		22.6
June 10	Seymour intake (Lower)	Burrard inlet	North Vancouver	Cline		14.7

LILLOOET DISTRICT.

Date 1915.	Stream.	Tributary To	Locality.	Engineer	Gauge Heights.	Discharge.
June 25	Island bar	Fraser river	Lillooet	Hughes & Gordon		37.0
Aug. 11	Island bar	Fraser river	Lillooet	Hughes		17.9
Dec. 5	Island bar	Fraser river	Lillooet	Hughes		2.5
June 20	Lillooet	Fraser river	Lillooet water supply	Gordon		0.4
June 20	Lillooet	Fraser river	Lillooet water supply above intake	Gordon		2.1
May 12	Riley	Fraser river	Lillooet	Cline	1.40	14.5
June 25	Riley	Fraser river	Lillooet	Hughes & Gordon		33.0
Aug.	Riley	Fraser river	Lillooet	Hughes		13.8
Dec. 5	Riley	Fraser river	Lillooet	Hughes		3.5
June 21	Swartz	Fraser river	Lillooet	Hughes & Gordon	0.80	22.8
Aug. 10	Swartz	Fraser river	Lillooet	Hughes	0.50	9.0
Dec. 4	Swartz	Fraser river	Lillooet	Hughes	0.40	5.98

VANCOUVER ISLAND DISTRICT.

Date 1915.	Stream.	Tributary To	Locality.	Engineer	Gauge Heights.	Discharge.
Sept. 27	Browne	Puntledge river	Courtenay	Hughes		2.5
Oct. 31	Browne	Puntledge river	Courtenay	Balls & Webb		605.0
Dec. 8	Holt	Cowichan	Duncan	Webb		240.0
Sept. 30	Millard	Puntledge river	Courtenay	Hughes		6.6
Sept. 28	Nanaimo south fork	Nanaimo	Nanaimo	Hughes		4.0
Oct. 12	Quinsam	Campbell river	Campbell river	Hughes		28.0
Oct. 27	Quinsam	Campbell river	Campbell river	Balls & Webb		850.0

REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER VII.

Kamloops Division.

HYDROMETRIC DATA.

CHAPTER VII.

KAMLOOPS DIVISION—HYDROMETRIC DATA.

KAMLOOPS DISTRICT.

BARRIERE RIVER.—(2084).

Location.—Below the city of Kamloops power plant, near the mouth of the river, and forty miles from Kamloops; Water District No. 2.

Records Available.—Continuous records have been kept from March 22 to December 31, 1915, which will be available when the station is more completely rated.

Gauge.—Chain gauge read three times a week by A. C. Champion.

Channel.—Water swift.

Discharge Measurements.—Five measurements during 1915, but not well enough distributed to define the rating curve properly.

Discharge Measurements of Barriere River below Power Plant.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 2	Tredcroft & Archibald	1,923	57	56	1.5	....	83
Mar. 15	E. H. Tredcroft	1,923	54	66	1.6	6.7	104
May 6	E. H. Tredcroft	1,923	85	254	4.7	9.5	1,200
Aug. 14	E. H. Tredcroft	1,923	73	107	2.6	7.5	280
Sept. 1	E. H. Tredcroft	1,923	64	88	2.2	7.0	199

BOLEAN CREEK.—(2002).

Location.—Section 10, township 18, range 12, west 6th meridian.

Records Available.—May 23 to December 31, 1911; January 1 to September 16, 1912; April 27 to September 19, 1913; April 1 to December 8, 1914; April 1 to September 30, 1915.

Drainage Area.—Eighty square miles.

Gauge.—Vertical staff read by Clement Stickney, Falkland, B.C.

Channel.—Gravel and sand, about 20 feet wide, which has shown a tendency to shift.

Discharge Measurements.—Nine measurements taken during 1912-13-14-15 cover all stages, except the peaks of the freshet.

Winter Flow.—Partial ice conditions usually prevail during December and January.

Accuracy.—The changes in the channel give a chance for certain inaccuracies, but otherwise the results should be very good.

Discharge Measurements of Bolean Creek near Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
May 13	C. E. Richardson	1,048	25	61.2	4.3	2.55	263
July 16	C. E. Richardson	1,048	23	51.8	1.7	1.39	31
1913							
April 23	H. J. E. Keys	1,057	21	27.1	2.1	1.68	57
June 18	H. J. E. Keys	1,057	28	29.8	2.8	2.10	82
1914							
June 22	C. B. Corbould	1,915	26	26.0	2.4	1.80	63
July 23	C. B. Corbould	1,915	20	15.1	1.4	1.30	21
Sept. 24	C. B. Corbould	1,915	16	6.8	1.1	1.15	8
1915							
Mar. 25	F. R. Archibald	1,673	26	12.1	0.9	1.25	11
June 17	A. L. McNaughton	1,915	27	31.7	2.9	2.08	93

Daily Gauge Height and Discharge of Bolean Creek near Mouth for 1915.

(Drainage area, 80 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.30	18.2	2.17	125	1.92	74	2.12	115	1.67	43.0	1.10	8.0
2	1.42	25.0	2.22	140	1.90	71	2.00	88	1.60	38.0	1.10	8.0
3	1.65	42.0	2.32	175	1.82	60	1.92	74	1.70	47.0	1.10	8.0
4	1.70	47.0	2.37	190	1.80	57	1.90	71	1.58	36.0	1.10	8.0
5	1.70	47.0	2.37	190	1.72	49	1.82	60	1.50	30.0	1.05	5.5
6	1.65	42.0	2.35	185	1.70	47	1.78	55	1.48	29.0	1.05	5.5
7	1.65	42.0	2.40	205	1.80	57	1.87	67	1.42	25.0	1.05	5.5
8	1.67	43.0	2.42	210	1.72	49	1.72	49	1.40	24.0	1.05	5.5
9	1.60	38.0	2.37	190	1.82	60	1.67	43	1.28	17.2	1.12	9.0
10	1.60	38.0	2.37	190	1.70	47	1.70	47	1.22	14.0	1.20	13.0
11	1.62	40.0	2.22	140	1.62	40	1.67	43	1.25	16.0	1.12	9.0
12	1.77	54.0	2.15	120	1.62	40	1.72	49	1.25	16.0	1.10	8.0
13	1.87	67.0	2.12	115	1.72	49	2.07	100	1.25	16.0	1.10	8.1
14	1.88	68.0	2.52	250	1.80	57	2.00	88	1.25	16.0	1.17	11.5
15	1.92	74.0	2.70	325	1.80	57	2.20	135	1.25	16.0	1.40	24.0
16	1.97	83.0	2.57	270	1.77	54	2.12	115	1.20	13.0	1.32	19.3
17	2.12	115.0	2.42	210	2.02	92	2.05	98	1.25	16.0	1.25	16.0
18	2.17	125.0	2.50	240	1.95	80	1.92	74	1.30	18.2	1.20	13.0
19	2.27	155.0	2.85	385	1.82	60	1.87	67	1.30	18.2	1.20	13.0
20	2.32	175.0	2.95	425	1.82	60	1.80	57	1.30	18.2	1.20	13.0
21	2.17	125.0	2.75	345	1.72	49	1.72	49	1.25	16.0	1.15	10.5
22	2.10	110.0	2.50	240	1.67	44	1.70	47	1.20	13.0	1.15	10.5
23	2.02	92.0	2.35	185	1.62	40	1.65	42	1.20	13.0	1.15	10.5
24	2.02	92.0	2.20	135	1.70	47	1.60	38	1.20	13.0	1.25	16.0
25	2.10	110.0	2.25	150	1.70	47	1.57	35	1.20	13.0	1.20	13.0
26	2.15	120.0	2.17	125	2.60	280	1.60	38	1.15	10.5	1.20	13.0
27	2.12	115.0	2.10	110	3.05	470	1.67	43	1.10	8.0	1.15	10.5
28	2.12	115.0	2.12	115	2.65	305	1.57	35	1.10	8.0	1.10	8.0
29	2.25	150.0	2.05	98	2.40	205	1.52	32	1.10	8.0	1.10	8.0
30	2.21	140.0	2.02	92	2.20	135	1.60	38	1.10	8.0	1.05	5.5
31	....	....	2.00	88	....	....	1.77	54	1.10	8.0	....	....

Monthly Discharge of Bolean Creek near Mouth for 1915.

(Drainage area, 80 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	155	18.2	83.6	1.04	1.16	4,970
May	425	88.0	192.0	2.40	2.77	11,800
June	470	40.0	93.0	1.16	1.29	5,530
July	135	32.0	63.0	0.79	0.91	3,870
August	47	8.0	19.0	0.24	0.28	1,170
September	24	5.5	10.5	0.13	0.14	620
The period	470	5.5	76.8	0.96	6.55	27,960

Campbell Creek.—(2004).

Location.—Section 26, township 19, range 16, west 6th meridian.

Records Available.—May 27 to October 4, 1911; April 1 to September 16, 1912; May 1 to August 31, 1913; April 1 to August 31, 1914; April 1 to September 30, 1915.

Drainage Area.—Two hundred square miles.

Gauge.—Vertical staff gauge read by A. Holt, of Barnhart Vale.

Channel.—Straight for about 100 feet at measuring section. Bed of stream sandy and fairly permanent. Average width of channel about 10 feet.

Discharge Measurements.—Gauge height-discharge curve is very well defined from ten meterings taken during 1914 and 1915.

Winter Flow.—Ice conditions prevail during December, January and February.

Accuracy.—High; results compiled from a well-rated curve.

Discharge Measurements of Campbell Creek at Barnhart Vale.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 17	E. M. Dann	1,505	9	6.7	0.8	0.88	5.5
May 5	Dann & Tredcroft	1,055	9	17.0	1.7	1.60	29.7
May 15	E. H. Tredcroft	1,055	20	33.9	2.1	2.60	72.0
June 20	C. B. Corbould	1,915	9	10.0	1.1	1.05	11.0
July 16	C. B. Corbould	1,915	11	12.1	1.6	1.25	19.0
July 21	C. B. Corbould	1,915	11	10.7	1.3	1.15	13.8
Sept. 26	C. B. Corbould	1,915	5	1.1	0.7	0.55	0.8
1915							
Mar. 23	F. R. Archibald	1,673	9	2.9	0.4	0.60	1.1
June 19	A. L. McNaughton	1,915	9	8.7	0.8	0.94	6.8
July 28	A. L. McNaughton	1,915	8	7.9	1.1	1.00	7.9

Daily Gauge Height and Discharge of Campbell Creek at Barnhart Vale for 1915.

(Drainage area, 200 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.55	0.8	0.75	3.5	0.96	7.8	1.70	34.0	0.90	6.4	0.72	3.0
2	0.55	0.8	0.77	3.9	0.97	8.0	1.78	37.0	0.90	6.4	0.72	3.0
3	0.55	0.8	0.72	3.0	1.22	15.4	1.78	37.0	0.88	6.0	0.70	2.6
4	0.55	0.8	0.70	2.6	1.27	17.2	1.76	36.0	0.82	4.8	0.70	2.6
5	0.55	0.8	0.72	3.0	1.30	18.3	1.72	35.0	0.80	4.4	0.70	2.6
6	0.55	0.8	0.75	3.5	1.20	14.7	1.60	30.0	0.80	4.4	0.70	2.6
7	0.55	0.8	0.75	3.5	1.20	14.7	1.50	26.0	0.72	3.0	0.70	2.6
8	0.57	1.0	0.75	3.5	1.20	14.7	1.45	24.0	0.70	2.6	0.70	2.6
9	0.58	1.1	0.75	3.5	1.17	13.7	1.42	23.0	0.70	2.6	0.70	2.6
10	0.60	1.3	0.75	3.5	1.12	12.1	1.40	22.0	0.70	2.6	0.70	2.6
11	0.60	1.3	0.75	3.5	1.07	10.7	1.42	23.0	0.72	3.0	0.67	2.2
12	0.60	1.3	0.75	3.5	1.01	9.0	1.41	22.0	0.72	3.0	0.67	2.2
13	0.60	1.3	0.77	3.9	1.00	8.7	1.40	22.0	0.72	3.0	0.67	2.2
14	0.60	1.3	0.77	3.9	1.00	8.7	1.35	20.0	0.71	2.8	0.70	2.6
15	0.60	1.3	0.90	6.4	0.95	7.5	1.30	18.3	0.70	2.6	0.70	2.6
16	0.60	1.3	0.97	8.0	0.90	6.4	1.30	18.3	0.70	2.6	0.70	2.6
17	0.60	1.3	1.15	13.1	0.97	8.0	1.30	18.3	0.70	2.6	0.70	2.6
18	0.60	1.3	1.30	18.3	1.05	10.1	1.30	18.3	0.70	2.6	0.70	2.6
19	0.60	1.3	1.40	22.0	0.90	6.4	1.30	18.3	1.00	8.7	0.70	2.6
20	0.60	1.3	1.37	21.0	0.92	6.9	1.27	17.2	0.95	7.5	0.69	2.4
21	0.61	1.4	1.45	24.0	0.89	6.2	1.27	17.2	0.83	5.0	0.65	2.1
22	0.67	2.2	1.47	25.0	0.88	6.0	1.25	16.5	0.80	4.4	0.65	2.0
23	0.77	3.9	1.42	23.0	0.88	6.0	1.10	11.5	0.80	4.4	0.62	1.6
24	0.85	5.4	1.53	22.0	0.91	6.6	0.97	8.0	0.77	3.9	0.62	1.6
25	0.87	5.8	1.37	21.0	0.92	6.9	0.90	6.4	0.76	3.7	0.62	1.6
26	0.85	5.4	1.27	17.2	1.13	12.5	1.95	7.5	0.75	3.5	0.60	1.3
27	0.80	4.4	1.05	10.1	1.30	18.3	1.00	8.7	0.75	3.5	0.60	1.3
28	0.75	3.5	0.96	7.8	1.30	18.3	1.00	8.7	0.72	3.0	0.60	1.3
29	0.71	2.8	1.02	9.3	1.40	22.0	0.97	8.0	0.70	2.6	0.60	1.3
30	0.70	2.6	1.00	8.7	1.50	26.0	0.97	8.0	0.70	2.6	0.60	1.3
31	....	....	1.00	8.7	....	....	0.90	6.4	0.72	3.0	....	....

Monthly Discharge of Campbell Creek at Barnhart Vale for 1915.

(Drainage area, 200 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	5.8	0.8	2.0	0.01	0.01	119
May	27.0	2.6	10.3	0.05	0.06	633
June	26.0	6.0	11.6	0.06	0.07	690
July	37.0	6.4	19.6	0.10	0.12	1,205
August	8.7	2.6	3.9	0.02	0.02	240
September	3.0	1.3	2.2	0.01	0.01	131
The period	37.0	0.8	8.2	0.04	0.29	3,018

CHERRY CREEK.—(2005).

Location.—Section 14, township 19, range 19, west 6th meridian.

Records Available.—June 5 to September 1, 1911; April 24 to September 15, 1912; April 19 to October 19, 1913; May 1 to August 19, 1914; April 1 to September 30, 1915.

Drainage Area.—Sixty-two square miles.

Gauge.—Standard·chain gauge installed during 1914 in canyon, and read daily by F. Bowers, during high water, and twice weekly during low water.

Channel.—Straight at measuring section. Velocity swift at all stages. Control is fairly good.

Discharge Measurements.—Eight discharge measurements made during 1914 and 1915 define rating curve very well except for discharges between 20 and 50 cubic feet per second.

Accuracy.—Results should be quite reliable except for the uncertainty in a portion of the rating curve not definitely located by measurements.

Discharge Measurements of Cherry Creek above Bowers Ranch.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 13	E. H. Tredcroft	1,055	14	14.0	5.0	1.70	70.3
June 11	C. B. Corbould	1,915	12	5.1	1.8	0.70	9.0
July 3	C. B. Corbould	1,915	7	1.7	0.8	0.50	1.5
1915							
Mar. 5	E. H. Tredcroft	1,923	3	1.2	0.1	0.30	0.1
April 29	F. R. Archibald	1,673	9	3.4	1.1	0.60	3.8
June 2	A. L. McNaughton	1,915	9	4.3	1.9	0.78	8.1
July 20	A. L. McNaughton	1,915	11	4.5	2.3	0.76	10.7
Aug. 18	A. L. McNaughton	1,915	7	2.7	0.8	0.55	2.3

Daily Gauge Height and Discharge of Cherry Creek at Bowers Ranch for 1915.

(Drainage area, 30 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.40	1.0	0.60	4.2	0.80	10.0	1.20	31.0	1.20	31.0	....	2.3
2	0.45	1.5	0.60	4.2	0.80	10.0	1.15	28.0	1.05	22.0	....	2.7
3	0.45	1.5	0.60	4.2	0.80	10.0	1.10	25.0	0.90	14.0	0.55	3.1
4	0.55	3.1	0.60	4.2	0.80	10.0	1.10	25.0	....	20.0	....	2.8
5	0.55	3.1	0.60	4.2	0.80	10.0	1.00	19.0	....	26.0	0.50	2.5
6	0.55	3.1	0.65	5.6	0.75	8.5	0.85	12.0	....	32.0	....	2.2
7	0.55	3.1	0.65	5.6	0.80	10.0	0.80	10.0	1.30	38.0	0.50	2.0
8	0.55	3.1	0.65	5.6	0.80	10.0	0.80	10.0	....	26.0	....	2.4
9	0.55	3.1	0.85	12.0	0.75	8.5	0.75	8.5	0.90	14.0	....	2.8
10	0.50	2.0	0.90	14.0	0.70	7.0	0.70	7.0	....	17.0	0.55	3.1
11	0.50	2.0	0.85	12.9	1.05	22.0	0.75	8.5	....	20.0	....	2.8
12	0.50	2.0	0.80	10.0	0.90	14.0	0.70	7.0	1.05	22.0	....	2.5
13	0.50	2.0	0.90	14.0	0.90	14.0	0.75	8.5	....	17.0	....	2.2
14	0.50	2.0	0.90	14.0	0.80	10.0	0.80	10.0	....	12.0	0.50	2.0
15	0.95	16.5	0.85	12.0	0.85	12.0	0.75	8.5	0.70	7.0	....	1.9
16	0.55	3.1	0.80	10.0	0.80	10.0	0.75	8.5	....	6.3	....	1.8
17	0.50	2.0	0.90	14.0	0.75	8.5	0.75	8.5	....	5.6	....	1.6
18	0.50	2.0	1.05	22.0	0.80	10.0	0.75	8.5	....	4.9	0.45	1.5
19	0.55	3.1	1.10	25.0	0.80	10.0	0.75	8.5	0.60	4.2	....	1.3
20	0.60	4.2	1.10	25.0	0.85	12.0	0.75	8.5	....	3.8	....	1.1
21	0.60	4.2	1.10	25.0	1.05	22.0	0.75	8.5	....	3.4	0.40	1.0
22	0.65	5.6	1.10	25.0	1.00	19.0	0.70	7.0	....	3.0	....	1.2
23	0.65	5.6	1.05	22.0	0.95	16.5	0.70	7.0	....	2.5	....	1.5
24	0.60	4.2	1.00	19.0	0.90	14.0	0.70	7.0	0.50	2.0	....	1.7
25	0.60	4.2	0.95	16.5	0.95	16.5	0.65	5.6	....	2.0	0.50	2.0
26	0.65	5.6	0.95	16.5	0.95	16.5	0.70	7.0	....	2.0	....	2.4
27	0.65	5.6	0.90	14.0	1.30	38.0	0.70	7.0	....	2.0	....	2.8
28	0.60	4.2	0.90	14.0	1.55	58.0	0.65	5.6	0.50	2.0	0.55	3.1
29	0.60	4.2	0.90	14.0	1.40	46.0	0.65	5.6	....	1.7	....	2.5
30	0.60	4.2	0.90	14.0	1.20	31.0	1.05	22.0	0.45	1.5	0.50	2.0
31	....	....	0.90	14.0	....	....	1.30	38.0	....	1.9	....	....

Monthly Discharge of Cherry Creek at Bowers Ranch for 1915.

(Drainage area, 30 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	16.0	1.0	3.7	0.12	0.13	220
May	25.0	4.2	13.4	0.45	0.52	824
June	58.0	7.0	16.5	0.55	0.61	982
July	38.0	5.6	12.3	0.41	0.47	756
August	38.0	1.5	11.8	0.39	0.45	726
September	3.1	1.0	2.2	0.07	0.08	131
The period	58.0	1.0	10.0	0.33	2.26	3,639

CLEARWATER RIVER.—(2047).

Location.—Near Raft river: Water District No. 2.

Records Available.—August 12 to December 31, 1913; January 1 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—Two thousand four hundred square miles.

Gauge.—Standard chain gauge graduated in feet and tenths, and read by Theo. Brookfield, rancher; repaired and datum changed March 13, 1915.

Measuring Section.—Five hundred feet above gauge; width of channel 230 feet. Bed of stream rocky and permanent. Deepest point in measuring section at highest recorded water level 22 feet.

Discharge Measurements.—Measurements are made from car suspended from ¾-inch cable.

Winter Flow.—The Clearwater river is seldom frozen during winter to the extent of materially affecting the accuracy of returns.

Accuracy.—Results should be very reliable except for discharges between 6,000 and 14,000 cubic feet per second, which are subject to a little uncertainty.

Discharge Measurements of Clearwater River near Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 16	K. G. Chisholm	1,055	200	2,043	2.04	5.8	4,170
May 30	E. H. Tredcroft	1,923	234	2,778	5.84	10.7	16,230
May 31	E. H. Tredcroft	1,923	234	2,735	5.75	10.4	15,740
June 1	E. H. Tredcroft	1,923	234	2,667	5.56	10.0	14,850
July 25	E. H. Tredcroft	1,923	234	2,599	5.66	10.1	14,720
Sept. 19	E. H. Tredcroft	1,923	201	2,022	2.61	6.6	5,280
1915							
Mar. 12	E. H. Tredcroft	1,923	169	1,373	0.76	3.5	1,050
April 28	E. H. Tredcroft	1,923	195	2,382	3.45	8.2	8,230

NOTE.—All measurements are referred to the new gauge installed March 13, 1915.

Daily Gauge Height and Discharge of Clearwater River near Mouth for 1915.

(Drainage area 2,400 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	4.17	1,740	3.60	1,130	3.40	950	4.70	2,380	8.55	9,600	10.60	16,400
2	4.17	1,740	3.70	1,230	3.40	950	5.00	2,790	8.66	9,600	10.50	16,000
3	4.17	1,740	3.70	1,230	3.40	950	5.40	3,350	8.60	9,740	10.30	15,300
4	4.05	1,600	3.80	1,330	3.40	950	6.10	4,400	8.70	10,000	10.20	15,000
5	4.05	1,600	3.80	1,330	3.50	1,040	6.30	4,730	8.90	10,600	10.15	14,800
6	4.05	1,600	3.80	1,330	3.50	1,040	6.40	4,900	9.20	11,600	10.25	15,200
7	4.05	1,600	3.80	1,330	3.50	1,040	6.50	5,070	9.55	12,700	10.45	15,900
8	4.17	1,740	3.80	1,330	3.50	1,040	6.65	5,330	10.00	14,300	10.35	15,500
9	4.17	1,740	3.80	1,330	3.50	1,040	6.65	5,330	10.37	15,600	10.20	15,000
10	4.17	1,740	3.80	1,330	3.50	1,040	6.60	5,240	11.02	17,900	9.90	13,900
11	4.17	1,740	3.70	1,230	3.50	1,040	6.60	5,240	11.45	19,400	9.70	13,300
12	4.10	1,660	3.70	1,230	3.50	1,040	6.80	5,600	11.15	18,300	9.60	12,900
13	4.17	1,740	3.70	1,230	3.50	1,040	7.10	6,140	10.95	17,600	9.50	12,600
14	4.05	1,600	3.60	1,130	3.60	1,140	7.20	6,340	10.90	17,400	9.45	12,400
15	4.05	1,600	3.60	1,130	3.70	1,230	7.30	6,540	10.80	17,100	9.60	12,900
16	4.05	1,600	3.60	1,130	3.75	1,280	7.40	6,740	10.75	16,900	9.80	13,600
17	3.90	1,440	3.60	1,130	3.70	1,230	7.60	7,170	10.60	16,400	10.10	14,600
18	3.90	1,440	3.60	1,130	3.80	1,330	7.80	7,630	10.50	16,000	10.15	14,800
19	3.80	1,330	3.60	1,130	3.80	1,330	7.90	7,850	10.60	16,400	10.20	15,000
20	3.80	1,330	3.60	1,130	3.90	1,440	8.10	8,350	11.05	18,000	10.10	14,600
21	3.80	1,330	3.50	1,040	4.00	1,550	8.20	8,600	11.20	18,500	10.10	14,600
22	3.70	1,230	3.50	1,040	4.10	1,660	8.10	8,350	11.50	19,500	9.90	13,900
23	3.70	1,230	3.50	1,040	4.10	1,660	8.10	8,350	11.65	20,100	9.80	13,600
24	3.60	1,130	3.50	1,040	4.20	1,770	8.10	8,350	11.60	19,900	9.90	13,900
25	3.60	1,130	3.50	1,040	4.20	1,770	8.15	8,480	11.50	19,500	9.95	14,100
26	3.60	1,130	3.40	950	4.20	1,770	8.20	8,600	11.50	19,500	10.40	15,700
27	3.60	1,130	3.40	950	4.20	1,770	8.25	8,740	11.35	19,000	10.60	16,400
28	3.50	1,040	3.40	950	4.30	1,880	8.25	8,740	11.35	19,000	10.40	15,700
29	3.50	1,040	....	....	4.30	1,880	8.40	9,150	11.30	18,800	10.25	15,200
30	3.50	1,040	....	....	4.40	2,000	8.55	9,600	10.95	17,600	10.10	14,600
31	3.50	1,040	....	....	4.50	2,120	....	....	10.70	16,700	....	....

	July.		August.		September.		October.		November.		December.	
1	10.05	14,500	10.20	15,000	9.20	11,600	6.00	4,240	6.55	5,160	4.90	2,650
2	10.00	14,300	10.40	15,700	9.00	10,900	6.00	4,240	6.55	5,160	4.90	2,650
3	10.00	14,300	10.45	15,900	8.80	10,300	6.00	4,240	6.50	5,070	4.90	2,650
4	10.10	14,600	10.45	15,900	8.65	9,900	5.95	4,160	6.40	4,900	4.95	2,720
5	10.10	14,600	10.30	15,300	8.55	9,590	5.90	4,090	6.35	4,810	4.95	2,720
6	10.15	14,800	10.20	15,000	8.40	9,150	5.80	3,940	6.30	4,730	4.90	2,650
7	10.20	15,000	10.10	14,600	8.25	8,740	5.70	3,790	6.25	4,650	4.95	2,720
8	10.20	15,000	10.00	14,300	8.15	8,470	5.65	3,710	6.10	4,400	5.05	2,860
9	10.30	15,300	10.00	14,300	7.90	7,850	5.60	3,640	6.00	4,240	5.00	2,790
10	10.50	16,000	9.95	14,100	7.65	7,280	5.55	3,560	5.90	4,090	4.95	2,720
11	10.50	16,000	9.90	13,900	7.40	6,730	5.50	3,490	5.80	3,940	4.90	2,650
12	10.45	15,900	9.80	13,600	7.15	6,230	5.45	3,420	5.70	3,790	4.85	2,580
13	10.40	15,700	9.70	13,300	7.00	5,940	5.45	3,420	5.60	3,640	4.80	2,510
14	10.70	16,700	9.60	12,900	6.90	5,770	5.50	3,490	5.50	3,490	4.80	2,510
15	11.00	17,800	9.55	12,700	6.80	5,590	5.45	3,420	5.40	3,350	4.80	2,510
16	11.30	18,800	9.50	12,600	6.70	5,420	5.45	3,420	5.40	3,350	4.75	2,450
17	11.30	18,800	9.55	12,700	6.75	5,500	5.40	3,350	5.45	3,420	4.75	2,450
18	11.00	17,800	9.60	12,900	6.75	5,500	5.55	3,560	5.40	3,350	4.75	2,450
19	10.80	17,100	9.65	13,100	6.75	5,500	5.65	3,710	5.35	3,280	4.75	2,450
20	10.60	16,400	9.70	13,300	6.70	5,420	5.75	3,860	5.30	3,210	4.70	2,380
21	10.50	16,000	9.80	13,600	6.65	5,330	5.75	3,860	5.25	3,140	4.70	2,380
22	10.40	15,700	9.75	13,400	6.60	5,240	5.80	3,940	5.25	3,140	4.70	2,380
23	10.35	15,500	9.75	13,400	6.50	5,070	5.85	4,010	5.25	3,140	4.65	2,310
24	10.30	15,300	9.70	13,300	6.40	4,900	5.95	4,160	5.20	3,070	4.65	2,310
25	10.25	15,200	9.60	12,900	6.30	4,730	6.05	4,320	5.15	3,000	4.65	2,310
26	10.20	15,000	9.55	12,700	6.20	4,560	6.20	4,560	5.10	2,930	4.65	2,310
27	10.15	14,800	9.50	12,600	6.05	4,320	6.30	4,730	5.05	2,860	4.65	2,310
28	10.15	14,800	9.40	12,200	6.10	4,900	6.40	4,900	5.00	2,790	4.60	2,250
29	10.10	14,600	9.30	11,900	6.00	4,240	6.45	4,980	4.95	2,720	4.60	2,250
30	10.10	14,600	9.25	11,700	5.95	4,160	6.50	5,070	4.90	2,650	4.60	2,250
31	10.15	14,800	9.25	11,700	....	....	6.55	5,160	....	....	4.60	2,250

Monthly Discharge of Clearwater River near Mouth for 1915.

(Drainage area, 2,400 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,740	1,040	1,445	0.60	0.69	89,000
February	1,330	950	1,163	0.48	0.50	65,000
March	2,120	950	1,354	0.56	0.65	83,000
April	9,600	2,380	6,603	2.75	3.07	393,000
May	20,100	9,600	16,234	6.76	7.79	998,000
June	16,400	12,400	14,580	6.07	6.77	868,000
July	18,800	14,300	15,668	6.53	7.53	963,000
August	15,900	11,700	13,565	5.65	6.51	834,000
September	11,600	4,160	6,611	2.75	3.07	393,000
October	5,160	3,350	4,014	1.67	1.92	247,000
November	5,160	2,650	3,716	1.55	1.73	221,000
December	2,860	2,250	2,496	1.04	1.20	153,000
The year	20,100	950	7,287	3.03	41.43	5,307,000

EDWARDS CREEK.—(2082).

Location.—Three miles from mouth, in section 26, township 22, range 16, west of the 6th meridian.

Records Available.—June 24 to October 31, 1911; April 20 to September 21, 1912; April 13 to September 30, 1915.

Drainage Area.—Fifteen square miles above gauging station.

Gauge.—Vertical staff read daily by H. Devick.

Channel.—Gravel.

Discharge Measurements.—Two in 1915 and six in 1911 and 1912 agree fairly well and cover all stages.

Accuracy.—Not sufficient measurements in 1915 to warrant a very high accuracy value being assigned. It should be noted that water was being drawn off from Edwards creek, above the gauging station, through Lyon's diversion (station No. 2083), and also 2 cubic feet per second through Devick's diversion, from June 8 to 16, 1915.

Discharge Measurements of Edwards Creek 3 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
June 24	C. G. Cline	1,046	5.0	1.5	0.7	0.64	1.2
Aug. 14	C. G. Cline	1,046	3.5	1.5	0.4	0.58	0.6
1912							
May 2	Cline & Dann	1,046	9.0	9.4	2.1	1.45	19.7
May 14	E. M. Dann	1,044	10.0	17.2	2.0	2.10	34.5
May 29	E. M. Dann	1,044	8.5	7.3	1.8	1.50	13.5
Aug. 20	H. J. E. Keys	1,057	7.5	3.8	1.1	1.01	4.2
1915							
April 13	F. R. Archibald	1,673	7.3	1.6	1.4	0.90	2.2
May 11	F. R. Archibald	1,673	7.0	1.6	1.1	0.85	1.7

Daily Gauge Height and Discharge of Edwards Creek 3 Miles from Mouth for 1915.

(Drainage area, 15 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	0.90	2	1.25	9	1.40	13	1.05	5	0.90	2
2	....	....	0.90	2	1.25	9	1.30	10	1.05	5	0.90	2
3	....	....	0.90	2	1.20	8	1.20	8	1.00	4	0.90	2
4	....	....	0.90	2	1.20	8	1.15	7	1.00	4	0.90	2
5	....	....	0.90	2	1.15	7	1.15	7	1.05	5	0.90	2
6	....	....	0.90	2	1.15	7	1.10	6	1.05	5	0.90	2
7	....	....	0.90	2	1.15	7	1.10	6	1.00	4	0.90	2
8	....	....	0.95	3	1.15	7	1.10	6	1.00	4	0.90	2
9	....	....	0.95	3	1.10	6	1.10	6	1.00	4	0.90	2
10	....	....	0.95	3	1.05	5	1.10	6	1.00	4	0.90	2
11	....	....	0.85	2	1.05	5	1.10	6	1.00	4	0.90	2
12	....	....	0.90	2	1.00	4	1.10	6	0.95	3	0.90	2
13	0.90	2	0.95	3	1.00	4	1.10	6	0.95	3	0.90	2
14	0.90	2	1.05	5	1.00	4	1.10	6	0.95	3	0.90	2
15	0.95	3	1.50	15	1.00	4	1.30	10	0.95	3	0.90	2
16	0.90	2	1.85	26	1.00	4	1.52	16	0.95	3	0.85	2
17	0.85	2	1.60	18	1.20	8	1.50	15	0.95	3	0.85	2
18	0.80	1	1.40	13	1.25	9	1.40	13	0.95	3	0.85	2
19	0.80	1	1.55	16	1.25	9	1.30	10	0.95	3	0.85	2
20	0.80	1	1.72	22	1.25	9	1.25	9	0.95	3	0.85	2
21	0.82	2	1.72	22	1.30	10	1.20	8	0.95	3	0.85	2
22	1.06	5	1.55	16	1.25	9	1.15	7	0.90	2	0.85	2
23	1.15	7	1.45	14	1.20	8	1.10	6	0.90	2	0.85	2
24	1.02	4	1.40	13	1.20	8	1.10	6	0.90	2	0.85	2
25	0.97	3	1.40	13	1.15	7	1.05	5	0.90	2	0.85	2
26	0.85	2	1.40	13	1.30	10	1.05	5	0.90	2	0.85	2
27	0.85	2	1.30	10	2.60	58	1.05	5	0.90	2	0.85	2
28	0.85	2	1.30	10	2.05	32	1.05	5	0.90	2	0.85	2
29	0.85	2	1.25	9	1.70	21	1.05	5	0.90	2	0.85	2
30	0.85	2	1.25	9	1.50	15	1.05	5	0.90	2	0.85	2
31	....	....	1.25	9	....	....	1.05	5	0.90	2	....	....

Monthly Discharge of Edwards Creek 3 Miles from Mouth for 1915.

(Drainage area, 15 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	26	2	9	....	....	550
June	58	4	11	....	....	650
July	16	5	8	....	....	490
August	5	2	3	....	....	180
September	2	2	2	....	....	120
The period	58	2	6.6	....	....	1,990

NOTE.—Water was being diverted from Edwards creek above this station through Lyons diversion from April 13 to August 4 with interruptions. A regular gauging station has been maintained on this diversion (No. 2083). From June 8 to 16, 1915, 2 cubic feet of water per second was diverted through Devick s ditch.

GUICHON CREEK.—(2014).

Location.—Near Mamit lake; Water District No. 3.

Records Available.—June 3 to December 31, 1911; January 1 to November 14, 1912; April 26 to September 29, 1913; April 1 to November 30, 1914; March 1 to September 30, 1915.

Drainage Area.—Three hundred and fifteen square miles.

Gauge.—Standard vertical staff gauge read daily by Miss O. Quenville.

Channel.—Channel is straight at measuring section. Velocities fairly high. Bed of stream composed of sand and gravel, and considered permanent.

Discharge Measurements.—Twenty-six discharge measurements have been taken on this creek during 1911-12-13-14-15. They agree very well and cover all stages.

Winter Flow.—Ice conditions generally prevail on this stream throughout January and February.

Accuracy.—Results should be very reliable at all stages.

Discharge Measurements of Guichon Creek above Mamit Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
June 3	W. M. Carlyle	1,044	27	41.7	1.50	2.16	61.3
June 27	W. M. Carlyle	1,044	16	10.1	0.73	0.96	7.4
July 18	W. M. Carlyle	1,044	16	9.2	0.51	0.87	4.7
Aug. 2	W. M. Carlyle	1,044	10	4.1	0.64	0.80	2.6
Aug. 9	W. M. Carlyle	1,044	15	7.4	1.30	1.02	9.8
1912							
April 28	H. J. E. Keys	1,057	21	27.4	1.84	1.95	50.0
May 11	H. J. E. Keys	1,057	63	279.0	1.50	6.05	420.0
May 22	H. J. E. Keys	1,057	54	178.0	1.36	5.20	260.0
June 1	H. J. E. Keys	1,057	26	68.8	1.75	3.11	121.0
June 9	H. J. E. Keys	1,057	28	37.7	1.46	1.98	55.1
June 24	H. J. E. Keys	1,057	22	20.8	1.07	1.41	22.4
July 1	H. J. E. Keys	1,057	26	19.2	1.13	1.30	21.6
July 13	H. J. E. Keys	1,057	26	29.1	1.40	1.72	39.0
July 14	H. J. E. Keys	1,057	26	29.3	1.30	1.62	39.0
July 29	H. J. E. Keys	1,057	26	21.1	1.26	1.48	29.1
Aug. 15	H. J. E. Keys	1,057	22	20.3	1.20	1.44	24.5
Aug. 31	H. J. E. Keys	1,057	24	18.0	1.09	1.30	19.5
Sept. 14	H. J. E. Keys	1,057	24	14.5	1.04	1.24	15.1
Sept. 24	H. J. E. Keys	1,057	24	14.6	0.82	1.18	12.1
1913							
May 28	H. J. E. Keys	1,057	26	77.6	1.60	3.44	126.0
Aug. 3	H. J. E. Keys	1,057	26	21.2	1.10	1.49	25.5
Aug. 17	H. J. E. Keys	1,057	24	16.3	1.06	1.20	17.3
1914							
June 16	C. B. Corbould	1,915	26	58.4	1.70	2.90	98.9
1915							
April 2	E. H. Tredcroft	1,916	22	18.6	0.81	1.48	15.1
June 7	A. L. McNaughton	1,915	22	37.6	1.65	2.20	62.0
July 23	A. L. McNaughton	1,915	21	33.9	1.70	2.13	57.5

Daily Gauge Height and Discharge of Guichon Creek above Mamit Lake for 1915.

(Drainage area, 315 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	1.10	12	1.40	23	2.05	53	3.05	110
2	......	......	......	......	1.10	12	1.40	23	2.00	50	2.80	93
3	......	......	......	......	1.10	12	1.50	28	1.90	46	2.80	93
4	......	......	......	......	1.10	12	1.50	28	1.80	41	2.60	82
5	......	......	......	......	1.20	16	1.50	28	1.75	39	2.35	68
6	......	......	......	......	1.15	14	1.50	28	1.70	37	2.25	63
7	......	......	......	......	1.15	14	1.50	28	1.65	34	2.20	60
8	......	......	......	......	1.20	16	1.50	28	1.65	34	2.20	60
9	......	......	......	......	1.15	14	1.50	28	1.65	34	2.20	60
10	......	......	......	......	1.15	14	1.45	25	1.65	34	2.20	60
11	......	......	......	......	1.15	14	1.40	23	1.60	32	2.20	60
12	......	......	......	......	1.15	14	1.45	25	1.65	34	2.20	60
13	......	......	......	......	1.15	14	1.60	32	1.70	37	2.15	58
14	......	......	......	......	1.30	19	1.65	32	1.70	37	2.15	58
15	......	......	......	......	1.40	23	1.65	34	1.70	37	2.00	50
16	......	......	......	......	1.45	25	1.65	34	1.80	41	2.00	50
17	......	......	......	......	1.50	28	1.70	37	2.20	60	2.00	50
18	......	......	......	......	1.60	32	1.80	41	2.20	60	3.35	125
19	......	......	......	......	1.60	32	1.85	43	2.80	93	4.10	175
20	......	......	......	......	1.60	32	1.95	48	3.95	165	4.05	170
21	......	......	......	......	1.60	32	2.05	53	4.80	225	3.65	145
22	......	......	......	......	1.60	32	2.10	55	5.00	240	3.20	120
23	......	......	......	......	1.60	32	2.20	60	4.85	230	3.20	120
24	......	......	......	......	1.55	30	2.15	58	4.55	205	3.50	135
25	......	......	......	......	1.55	30	2.05	53	4.10	175	4.00	170
26	......	......	......	......	1.55	30	2.00	50	4.00	170	4.85	230
27	......	......	......	......	1.40	23	1.95	48	3.85	160	5.10	250
28	......	......	......	......	1.40	23	1.95	48	3.70	150	5.10	250
29	......	......	......	......	1.40	23	1.95	48	3.55	140	4.85	230
30	......	......	......	......	1.40	23	2.05	53	3.35	125	4.75	220
31	......	......	......	......	1.40	23	......	......	3.20	120	......	......

	July.		August.		September.		October.		November.		December.	
1	3.8	155	2.15	58	1.3	19	......	......	......	......	......	......
2	3.8	155	2.10	55	1.4	23	......	......	......	......	......	......
3	3.8	155	2.10	55	1.4	23	......	......	......	......	......	......
4	3.8	155	2.05	53	1.4	23	......	......	......	......	......	......
5	3.1	110	2.05	53	1.4	23	......	......	......	......	......	......
6	2.95	100	2.00	50	1.4	23	......	......	......	......	......	......
7	2.75	90	1.95	48	1.4	23	......	......	......	......	......	......
8	2.75	90	1.90	46	1.4	23	......	......	......	......	......	......
9	2.75	90	1.90	46	1.4	23	......	......	......	......	......	......
10	2.50	76	1.90	46	1.4	23	......	......	......	......	......	......
11	2.40	71	1.85	43	1.4	23	......	......	......	......	......	......
12	2.45	71	1.80	41	1.4	23	......	......	......	......	......	......
13	2.55	79	1.80	41	1.4	23	......	......	......	......	......	......
14	2.70	87	1.75	39	1.4	23	......	......	......	......	......	......
15	2.70	87	1.70	37	1.4	23	......	......	......	......	......	......
16	2.65	84	1.70	37	1.4	23	......	......	......	......	......	......
17	2.55	79	1.65	34	1.35	21	......	......	......	......	......	......
18	2.45	73	1.65	34	1.35	21	......	......	......	......	......	......
19	2.25	63	1.60	32	1.32	20	......	......	......	......	......	......
20	2.20	60	1.60	32	1.3	19	......	......	......	......	......	......
21	2.20	60	1.55	30	1.3	19	......	......	......	......	......	......
22	2.15	58	1.50	28	1.3	19	......	......	......	......	......	......
23	2.10	55	1.45	25	1.3	19	......	......	......	......	......	......
24	2.10	55	1.40	23	1.3	19	......	......	......	......	......	......
25	2.20	60	1.40	23	1.3	19	......	......	......	......	......	......
26	2.25	63	......	23	1.3	19	......	......	......	......	......	......
27	2.25	63	1.40	23	1.3	19	......	......	......	......	......	......
28	2.30	65	1.35	21	1.3	19	......	......	......	......	......	......
29	2.25	63	1.30	19	1.3	19	......	......	......	......	......	......
30	2.20	60	1.30	19	1.3	19	......	......	......	......	......	......
31	2.20	60	1.30	19	......	......	......	......	......	......	......	......

Monthly Discharge of Guichon Creek above Mamit Lake for 1915.

(Drainage area, 315 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	32	12	21.6	0.07	0.08	1,330
April	60	23	38.1	0.12	0.13	2,260
May	240	32	94.8	0.30	0.35	5,830
June	250	50	115.8	0.36	0.40	6,900
July	155	55	83.6	0.27	0.31	5,140
August	58	19	36.5	0.12	0.14	2,240
September	23	19	21.2	0.07	0.08	1,260
The period	250	12	58.8	0.18	1.49	24,960

NOTE.—There are a few small irrigation diversions above this station.

HEFFLEY CREEK, BELOW HEFFLEY LAKE.—(2019).

Location.—Section 9, township 22, range 16, west 6th meridian.

Records Available.—May 25 to December 8, 1911; April 1 to September 20, 1912; May 11 to September 19, 1913; May 1 to December 9, 1914; April 1 to September 30, 1915.

Drainage Area.—Twenty-eight square miles.

Gauge.—Standard vertical staff gauge read daily by F. S. Lawrence.

Channel.—Straight at measuring section and permanent bed.

Discharge Measurements.—Seven measurements during 1914 and 1915 agree very well and cover the whole range of stage.

Winter Flow.—Ice conditions generally prevail during January and February.

Accuracy.—Results should be quite reliable at all stages.

Discharge Measurements of Heffley Creek below Heffley Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 28	K. G. Chisholm	1,055	8.0	5.30	0.77	3.75	4.1
June 3	C. B. Corbould	1,915	10.0	7.03	0.90	3.92	6.2
June 30	C. B. Corbould	1,915	10.0	6.50	0.91	3.90	5.9
Aug. 11	C. B. Corbould	1,915	10.0	10.60	2.10	4.24	22.3
Oct. 29	C. B. Corbould	1,673	8.0	3.47	0.28	3.40	1.0
1915							
April 13	F. R. Archibald	1,673	9.0	3.35	0.50	3.60	1.6
May 12	F. R. Archibald	1,673	9.5	7.92	1.16	4.03	9.2

Daily Gauge Height and Discharge of Heffley Creek below Heffley Lake for 1915.

(Drainage area, 28 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.51	1.3	3.78	4.0	3.83	4.8	3.72	3.1	4.04	9.9	4.03	9.5
2	3.51	1.3	3.78	4.0	3.82	4.6	3.71	3.0	4.04	9.9	....	9.4
3	3.51	1.3	3.78	4.0	3.80	4.2	3.70	2.9	4.03	9.5	4.02	9.2
4	3.50	1.2	3.78	4.0	3.78	4.0	3.70	2.9	4.03	9.5	4.02	9.2
5	3.49	1.2	3.78	4.0	3.76	3.7	3.68	2.7	4.02	9.2	4.00	8.4
6	3.49	1.2	3.78	4.0	3.78	3.7	3.65	2.4	4.02	9.2	4.00	8.4
7	3.57	1.7	3.78	4.0	3.75	3.6	3.65	2.4	4.02	9.2	4.00	8.4
8	3.55	1.6	3.81	4.4	3.73	3.3	3.65	2.4	4.02	9.2	4.00	8.4
9	3.52	1.4	3.91	6.2	3.72	3.1	3.64	2.3	4.01	8.8	4.03	9.5
10	3.51	1.3	4.00	8.4	3.70	2.9	3.64	2.3	4.01	8.8	4.08	11.4
11	3.51	1.3	4.04	9.9	3.69	2.8	3.83	4.8	4.01	8.8	4.08	11.4
12	3.53	1.5	4.03	9.5	3.68	2.7	....	4.5	4.01	8.8	4.05	10.3
13	3.61	2.0	4.14	14.8	....	4.2	3.80	4.2	4.01	8.8	4.00	8.4
14	3.61	2.0	4.22	20.5	3.88	5.6	3.92	6.3	4.07	11.1	3.98	7.9
15	....	2.1	4.24	22.3	3.88	5.6	3.98	7.9	4.09	11.8	3.97	7.6
16	3.63	2.2	4.26	24.1	3.88	5.6	3.98	7.9	4.09	11.8	3.95	7.1
17	3.67	2.6	4.23	21.4	3.90	5.9	2.77	3.9	4.09	11.8	....	6.6
18	3.68	2.7	4.05	10.3	3.91	6.0	....	3.4	4.09	11.8	3.91	6.1
19	3.68	2.7	4.05	10.3	3.90	5.9	3.69	2.8	4.09	11.8	3.89	5.8
20	3.72	3.1	4.25	23.2	3.89	5.8	3.66	2.5	4.08	11.4	3.89	5.8
21	3.72	3.1	4.25	23.2	3.89	5.8	3.65	2.4	4.08	11.4	3.89	5.8
22	3.72	3.1	4.19	18.0	3.86	5.3	3.65	2.4	4.08	11.4	3.89	5.8
23	3.70	2.9	4.16	16.1	3.82	4.6	3.65	2.4	4.07	11.1	3.89	5.8
24	3.70	2.9	4.10	12.2	3.84	4.9	3.65	2.4	4.07	11.1	....	5.8
25	3.70	2.9	4.05	10.3	3.80	4.2	3.65	2.4	4.06	10.7	3.89	5.8
26	3.70	2.9	4.00	8.4	3.78	4.0	3.70	2.9	4.06	10.7	3.88	5.6
27	3.71	3.0	3.95	7.2	3.81	4.4	3.75	3.6	....	10.3	3.88	5.6
28	3.70	2.9	3.94	6.9	3.81	4.4	3.76	3.7	4.04	9.9	3.87	5.4
29	3.75	3.5	3.91	6.2	3.79	4.1	....	3.6	4.04	9.9	3.87	5.4
30	3.78	4.0	3.90	5.9	3.75	3.6	3.75	3.6	4.03	9.5	3.87	5.4
31	....	....	3.88	5.6	....	....	3.95	7.1	4.03	9.5	....	....

Monthly Discharge of Heffley Creek below Heffley Lake for 1915.

(Drainage area, 28 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.............	4.0	1.2	2.2	0.08	0.09	133
May.......... .	24.1	4.0	10.8	0.38	0.44	664
June................	6.0	2.7	4.5	0.16	0.18	268
July................ .	7.9	2.3	3.6	0.13	0.15	221
August.......	11.8	8.8	10.2	0.36	0.41	627
September......	11.4	5.4	7.5	0.27	0.30	446
The period........	24.1	1.2	6.4	0.23	1.57	2,359

NOTE.—The flow at this station is regulated by a storage dam on Heffley lake.

HEFFLEY CREEK, ABOVE DIVERSIONS AT MOUTH.—(2018).

Location.—Section 11, township 22, range 17, west 6th meridian.

Records Available.—August 19 to October 31, 1911; April 3 to September 15, 1912; April 13 to September 15, 1913; April 1 to December 6, 1914; March 1 to September 30, 1915.

Drainage Area.—Sixty-five square miles.

Gauge.—Vertical staff gauge read daily by Mrs. J. Austin.

Channel.—About 15 feet wide, with rocky bed.

Discharge Measurements.—Three measurements in 1915, at low stages, and fourteen during 1911-12-13-14. There seems to have been some change in the channel and only the 1915 measurements are used for defining the lower part of the curve.

Accuracy.—Results affected somewhat by changes in channel. The flow is regulated on Heffley lake, and there are diversions in the upper part of the watershed.

Discharge Measurements of Heffley Creek above Diversions at Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Aug. 19	C. G. Cline	1,046	6.5	3.0	0.4	0.81	1.3
Sept. 13	C. G. Cline	1,046	7.0	3.6	0.5	0.88	1.9
1912							
April 3	C. G. Cline	1,057	6.0	3.6	0.8	1.00	3.0
May 13	E. M. Dann	1,044	12.5	16.1	3.5	2.05	54.8
May 14	E. M. Dann	1,044	13.5	19.2	3.7	2.20	71.7
May 30	E. M. Dann	1,044	9.0	8.2	2.9	1.60	23.3
June 10	E. M. Dann	1,044	8.0	3.6	1.0	1.00	3.6
Aug. 19	H. J. E. Keys	1,057	8.5	3.4	1.7	1.06	5.8
1913							
June 25	H. J. E. Keys	1,057	13.0	10.1	1.0	1.32	10.5
1914							
June 1	C. B. Corbould	1,915	10.0	5.7	1.3	1.20	7.5
June 29	C. B. Corbould	1,915	8.0	5.5	1.2	1.10	6.7
Aug. 14	C. B. Corbould	1,915	8.0	5.7	1.2	1.15	6.9
Sept. 8	Tredcroft & Corbould	1,923	7.0	2.5	0.3	0.80	0.8
Oct. 29	C. B. Corbould	1,673	7.5	4.6	0.6	1.00	2.6
1915							
April 12	F. R. Archibald	1,673	7.0	3.1	0.5	0.94	1.5
April 17	F. R. Archibald	1,673	7.5	3.7	0.6	1.07	2.3
May 11	F. R. Archibald	1,673	9.0	5.1	1.1	1.20	5.5

Daily Gauge Height and Discharge of Heffley Creek above Diversions, near Mouth, for 1915.

(Drainage area, 65 square miles.)

Day.	January		February		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1					0.97	2	1.00	2	1.05	2	1.28	8
2					1.00	2	0.98	2	1.03	2	1.23	7
3					1.00	2	0.91	1	1.05	2	1.22	7
4					1.07	3	0.92	1	1.00	2	1.20	5
5					1.00	2	0.92	1	1.00	2	1.18	5
6					1.00	2	0.92	1	0.90	1	1.16	4
7					1.00	2	1.01	2	0.90	1	1.18	5
8					1.00	2	1.12	3	0.90	1	1.16	4
9					1.00	2	1.10	3	0.90	1	1.13	3
10					1.00	2	1.06	3	1.14	4	1.00	2
11					1.00	2	0.95	2	1.19	5	1.07	3
12					1.00	2	0.93	2	1.22	5	1.15	4
13						2	1.02	2	1.37	11	1.17	4
14					1.02	2	1.05	2	1.60	22	1.18	4
15					1.06	3	1.10	3	1.75	31	1.20	5
16					1.08	3	1.01	2	1.80	35	1.22	6
17					1.05	2	1.02	2	1.77	33	1.31	8
18					1.07	3	1.05	2	1.60	22	1.37	11
19					1.07	3	0.97	2	1.67	26	1.36	10
20					1.05	3	0.95	1	1.80	35	1.40	12
21					1.07	3	1.05	2	1.72	30	1.40	12
22					1.06	3	1.02	2	1.65	25	1.38	11
23					1.06	3	1.28	7	1.60	22	1.37	11
24					1.03	2	1.02	2	1.55	19	1.30	8
25					0.98	2	1.02	2	1.55	19	1.29	8
26					1.15	4	1.01	2	1.50	16	1.28	8
27					1.05	3	0.97	2	1.42	13	1.80	35
28					0.98	2	0.98	2	1.40	12	1.85	40
29					0.98	2	1.00	2	1.34	10	1.61	22
30					1.00	2	1.00	2	1.31	8	1.47	15
31					1.00	2			1.28	8		

	July.		August.		September.		October		November		December	
1	1.41	12	1.06	2	1.15	4						
2	1.37	11	1.12	3	1.15	4						
3	1.31	8	1.20	5	1.15	4						
4	1.27	7	1.21	5	1.15	4						
5	1.21	5	1.15	4	1.15	4						
6	1.16	4	1.15	4	1.15	4						
7	1.07	3	1.18	4	1.15	4						
8	1.07	3	1.17	4	1.15	4						
9	1.10	3	1.15	4	1.20	5						
10	1.12	3	1.12	3	1.20	5						
11	1.17	4	1.12	3	1.20	5						
12	1.20	5	1.12	3	1.20	5						
13	1.21	5	1.12	3	1.15	4						
14	1.23	6	1.12	3	1.16	4						
15	1.45	14	1.15	4	1.16	4						
16	1.57	20	1.15	4		4						
17	1.47	15	1.15	4	1.15	4						
18	1.39	12	1.17	4	1.15	4						
19	1.35	10	1.17	4	1.15	4						
20	1.32	9	1.17	4	1.12	4						
21	1.23	6	1.17	4	1.15	4						
22	1.15	4	1.16	4	1.16	4						
23	1.08	3	1.16	4		4						
24	1.09	3	1.15	4	1.15	4						
25	1.02	2	1.15	4	1.16	4						
26	1.00	2	1.17	4	1.18	5						
27	1.00	2	1.17	4	1.20	5						
28	1.00	2	1.15	4	1.20	5						
29	1.02	2	1.15	4	1.19	5						
30	1.00	2	1.15	4	1.17	5						
31	1.00	2	1.13	4								

Monthly Discharge of Heffley Creek above Diversions, near Mouth, for 1915.

(Drainage area, 65 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	4	2	2	....	....	130
April	7	1	2	....	....	120
May	35	1	14	....	....	860
June	40	2	10	....	....	590
July	20	2	6	....	....	370
August	5	3	4	....	....	250
September	5	4	4	....	....	240
The period	40	1	6	....	....	2,560

NOTE.—The flow is regulated by a storage dam on Heffley lake and there are diversions in the upper part of the watershed.

INGRAM CREEK.—(2020).

Location.—Section 23, township 17, range 13, west 6th meridian.

Records Available.—April 1 to October 4, 1911; April 1 to August 31, 1912; April 1 to September 16, 1913; May 6 to November 11, 1914; April 1 to September 30, 1915.

Drainage Area.—Twenty-five square miles.

Gauge.—The gauge is a vertical staff gauge read daily by Miss S. King.

Channel.—Rocky, steep gradient and swift water.

Discharge Measurements.—Five measurements made during 1914-15 agree very well and cover the whole range of stage.

Winter Flow.—Ice conditions usually exist during December, January and February.

Accuracy.—The general accuracy of results is considered high for all stages.

Discharge Measurements of Ingram Creek above Diversions.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 6	Dann & Tredcroft	1,055	18	14.0	3.14	1.92	43.9
June 23	C. B. Corbould	1,915	17	7.1	1.70	1.25	12.2
July 23	C. B. Corbould	1,915	8	4.7	0.65	1.00	3.2
Sept. 24	C. B. Corbould	1,915	7	2.8	0.40	0.88	1.1
1915							
June 17	A. L. McNaughton	1,915	8	5.3	3.35	1.45	17.7

Daily Gauge Height and Discharge of Ingram Creek near Grand Prairie for 1915.

(Drainage area, 25 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.10	6.4	1.45	18.8	1.60	26.0	1.75	32.0	1.10	6.4	1.00	3.9
2	0.90	2.2	1.40	16.7	1.50	21.0	1.60	26.0	1.05	5.1	1.05	5.1
3	0.95	3.0	1.40	16.7	1.50	21.0	1.80	35.0	1.05	5.1	1.05	5.1
4	1.15	7.9	1.40	16.7	1.45	18.8	1.65	28.0	1.00	3.9	1.05	5.1
5	1.00	3.9	1.40	16.7	1.45	18.8	1.60	26.0	1.00	3.9	1.05	5.1
6	1.05	5.1	1.35	14.8	1.50	21.0	1.50	21.0	1.00	3.9	1.10	6.4
7	1.10	6.4	1.35	14.8	1.60	26.0	1.50	21.0	0.95	3.0	1.10	5.4
8	1.10	6.4	1.35	14.8	1.70	30.0	1.40	16.7	0.90	2.2	1.10	6.4
9	1.00	3.9	1.30	13.0	1.50	21.0	1.35	14.8	0.90	2.2	1.15	7.9
10	1.05	5.1	1.25	11.2	1.40	16.7	1.25	11.2	0.85	1.5	1.20	9.4
11	1.10	6.4	1.30	13.0	1.35	14.8	1.30	13.0	0.90	2.2	1.15	7.9
12	1.15	7.9	1.30	13.0	1.40	16.7	1.40	16.7	0.90	2.2	1.15	7.9
13	1.20	9.4	1.35	14.8	1.35	14.8	1.45	18.8	0.85	1.5	1.10	6.4
14	1.20	9.4	1.40	16.7	1.60	26.0	1.50	21.0	0.85	1.5	1.20	9.4
15	1.25	11.2	1.40	16.7	1.35	14.8	1.40	16.7	0.80	0.8	1.30	13.0
16	1.15	7.9	1.40	16.7	1.40	16.7	1.30	13.0	0.95	3.0	1.30	13.0
17	1.20	9.4	1.40	16.7	1.50	21.0	1.25	11.2	1.00	3.9	1.25	11.2
18	1.25	11.2	1.45	18.8	1.50	21.0	1.25	11.2	1.05	5.1	1.20	9.4
19	1.30	13.0	2.00	47.0	1.50	21.0	1.20	9.4	1.00	3.9	1.10	6.4
20	1.35	14.8	2.10	53.0	1.45	18.8	1.20	9.4	1.10	6.4	1.10	6.4
21	1.25	11.2	2.10	53.0	1.40	16.7	1.20	9.4	1.00	3.9	1.05	5.1
22	1.30	13.0	2.00	47.0	1.35	14.8	1.15	7.9	1.00	3.9	1.05	5.1
23	1.30	13.0	1.90	41.0	1.35	14.8	1.15	7.9	1.00	3.9	1.10	6.4
24	1.35	14.8	1.80	35.0	1.30	13.0	1.10	6.4	0.95	3.0	1.20	9.4
25	1.35	14.8	1.70	30.0	1.25	11.2	1.20	9.4	0.95	3.0	1.10	6.4
26	1.30	13.0	1.60	26.0	1.50	21.0	1.10	6.4	0.90	2.2	1.05	5.1
27	1.30	13.0	1.65	28.0	2.00	47.0	1.10	6.4	0.85	1.5	1.00	3.9
28	1.35	14.8	1.65	28.0	2.20	60.0	1.15	7.9	0.85	1.5	1.00	3.9
29	1.40	16.7	1.60	26.0	2.20	60.0	1.20	9.4	0.85	1.5	1.10	6.4
30	1.40	16.7	1.55	23.0	1.75	32.0	1.10	6.4	0.80	0.8	1.15	7.9
31	....	....	1.60	26.0	....	....	1.10	6.4	0.85	1.5	....	....

Monthly Discharge of Ingram Creek above Diversion for 1915.

(Drainage area, 25 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	16.7	2.2	9.7	0.39	0.43	577
May	53.0	11.2	24.0	0.96	1.11	1,476
June	60.0	11.2	23.2	0.93	1.04	1,380
July	35.0	6.4	14.7	0.59	0.68	904
August	6.4	0.8	3.0	0.12	0.14	184
September	13.0	3.9	7.0	0.28	0.31	416
The period	60.0	0.8	13.6	0.54	3.71	4,937

JAMIESON CREEK.—(2022).

Location.—Section 21, township 22, range 17, west of the 6th meridian.

Records Available.—June 22 to October 30, 1911; April 3 to October 30, 1912; May 1 to October 1, 1913; January 1 to January 24, and April 1 to December 9, 1914; April 1 to September 30, 1915.

Drainage Area.—Sixty-six square miles.

Gauge.—Vertical staff gauge situated above British Columbia Fruitlands Diversion, and read daily by J. Crack, rancher.

Channel.—Is approximately 30 feet in width, with rocky bed.

Discharge Measurements.—Are made from highway bridge at high water and by wading at low water. Fourteen measurements made during 1911-12-13-14-15 agree very well and cover the whole range of stage.

Accuracy.—Results should be quite reliable for all stages.

Discharge Measurements of Jamieson Creek above B.C. Fruitland's Diversion.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
June 20	C. G. Cline	1,046	24	28	2.2	2.35	61.0
Aug. 20	C. G. Cline	1,046	19	13	0.6	1.78	8.4
Oct. 7	C. G. Cline	1,046	20	15	0.5	1.82	7.6
1912							
May 10	E. M. Dann	1,046	....	....	....	3.60	354.0
July 8	H. J. E. Keys	1,057	23	31	1.8	2.33	56.0
1913							
June 11	H. J. E. Keys	1,057	26	26	3.5	2.65	103.0
July 16	H. J. E. Keys	1,057	31	57	2.8	2.88	167.0
1914							
May 10	E. H. Tredcroft	1,055	28	63	7.5	3.80	490.0
May 25	Tredcroft & Corbould	1,923	30	54	5.6	3.50	343.0
June 30	E. H. Tredcroft	1,923	35	34	1.9	2.36	65.5
Aug. 5	C. B. Corbould	1,923	24	40	0.6	2.00	26.0
Aug. 26	Tredcroft & Corbould	1,923	20	18	0.5	1.81	8.6
1915							
Mar. 8	E. H. Tredcroft	1,923	19	15	0.2	1.76	3.3
May 4	E. H. Tredcroft	1,923	43	50	3.1	2.90	154.0

Daily Gauge Height and Discharge of Jamieson Creek above B.C. Fruitland's Diversion for 1915.

(Drainage area, 66 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.00	0.1	2.80	130	2.55	90	2.35	60	2.30	53	2.20	40
2	1.00	0.1	2.70	110	2.50	82	2.35	60	2.30	53	2.15	34
3	1.05	0.1	2.80	130	2.40	67	2.40	67	2.25	46	2.20	40
4	1.10	0.2	2.90	150	2.35	60	2.45	74	2.25	46	2.20	40
5	2.20	40.0	3.00	170	2.30	53	2.45	74	2.20	40	2.10	29
6	2.30	53.0	3.00	170	2.30	53	2.40	67	2.15	34	2.15	35
7	2.35	60.0	3.05	185	2.30	53	2.40	67	2.15	34	2.10	29
8	2.40	67.0	3.00	170	2.35	60	2.40	67	2.10	29	2.10	29
9	2.40	67.0	3.00	170	2.40	67	2.35	60	2.10	29	2.15	35
10	2.35	60.0	3.00	170	2.40	67	2.40	67	2.10	29	2.10	29
11	2.35	60.0	2.85	140	2.35	60	2.35	60	2.10	29	2.10	29
12	2.50	82.0	2.70	110	2.30	53	2.35	60	2.10	29	2.15	35
13	2.55	89.0	....	155	2.30	53	2.30	53	2.35	60	2.10	29
14	2.65	105.0	3.10	195	2.25	46	2.40	67	2.40	67	2.10	29
15	2.60	97.0	3.10	195	2.45	74	2.60	97	2.40	67	2.10	29
16	2.90	150.0	3.30	250	2.40	67	2.75	120	2.40	67	2.10	29
17	3.00	170.0	3.25	235	2.45	74	2.60	97	2.40	67	2.00	20
18	3.10	200.0	3.20	220	2.50	82	2.50	82	2.35	60	2.00	20
19	3.25	235.0	3.45	305	2.60	97	2.45	74	2.35	60	2.00	20
20	3.40	285.0	3.20	220	2.55	89	2.45	74	2.35	60	1.95	16
21	3.60	375.0	3.05	185	2.45	74	2.40	67	2.35	60	1.95	16
22	2.90	150.0	3.00	170	2.40	67	2.40	67	2.30	53	1.90	13
23	3.00	170.0	2.95	160	2.40	67	2.40	67	2.30	53	1.90	13
24	2.80	130.0	2.80	130	2.35	60	2.35	60	2.30	53	1.90	13
25	3.20	220.0	2.75	120	2.30	53	2.30	53	2.30	53	1.85	10
26	3.40	285.0	2.70	110	2.90	150	2.30	53	2.25	46	1.85	10
27	3.00	170.0	2.60	97	3.15	210	2.30	53	2.25	46	1.85	10
28	2.80	130.0	2.65	105	2.95	160	2.30	53	2.20	40	1.85	10
29	2.85	140.0	2.60	97	2.70	112	2.30	53	2.20	40	1.80	8
30	2.80	130.0	2.60	97	2.65	104	2.30	53	2.20	40	1.80	8
31	....	....	2.65	105	....	....	2.30	53	2.20	40	....	....

Monthly Discharge of Jamieson Creek above B.C. Fruitland's Diversion for 1915.

(Drainage area, 66 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	375	0.1	124	1.88	2.10	7,380
May	305	97.0	160	2.42	2.79	9,840
June	210	46.0	80	1.21	1.35	4,760
July	120	53.0	67	1.01	1.16	4,120
August	67	29.0	48	0.73	0.84	2,950
September	40	8.0	24	0.36	0.40	1,430
The period	375	0.1	94	1.27	8.64	30,480

NOTE.—Regulated by a storage dam.

LITTLE CLEARWATER CREEK.—(2056).

Location.—Near Raft river; Water District No. 2.

Records Available.—June 17 to December 31, 1914; January 1 to September 30, 1915.

Drainage Area.—One hundred square miles.

Gauge.—Standard vertical staff gauge set near footbridge, at crossing of Murtle river trail, and read by P. McDougall, rancher.

Channel.—Average width 40 feet. The velocities are low even at high water, seldom exceeding 2.0 feet per second. Bed of stream at measuring section composed of mud and silt.

Discharge Measurements.—Four measurements made during 1914 and 1915 cover practically the whole range of stage, but leave certain intermediate parts somewhat indefinite.

Winter Flow.—Partial ice conditions exist during latter end of January and beginning of February.

Accuracy.—The results are probably quite reliable but, before a very high accuracy value can be assigned, a few more measurements will be needed at intermediate stages.

Discharge Measurements of Little Clearwater Creek 5 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
June 6	E. H. Tredcroft	1,923	41	147	1.8	2.50	272
1915							
May 20	E. H. Tredcroft	1,923	43	188	2.5	3.75	472
Aug. 10	E. H. Tredcroft	1,923	35	77	0.7	0.77	53
Nov. 1	A. L. McNaughton	1,915	37	79	0.8	0.85	62

Daily Gauge Height and Discharge of Little Clearwater River 5 Miles above Mouth for 1915.

(Drainage area, 84 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.60	38	Ice	30	0.40	22	1.10	85	2.25	230	2.00	200
2	0.60	38	Ice	30	0.40	22	1.20	95	2.30	240	2.00	200
3	0.60	38	Ice	30	0.40	22	1.60	145	2.50	270	1.90	185
4	0.60	38	0.60	38	0.40	22	1.90	185	2.70	300	1.85	175
5	0.60	38	0.60	38	0.40	22	1.80	170	....	320	1.85	175
6	0.60	38	0.60	38	0.40	22	1.80	170	....	340	1.85	175
7	0.60	38	0.50	30	0.40	22	1.80	170	3.15	370	....	170
8	0.60	38	0.50	30	0.40	22	1.80	170	3.50	430	....	165
9	0.60	38	0.50	30	0.40	22	....	180	3.50	430	....	160
10	0.60	38	0.50	30	0.40	22	....	180	3.40	415	....	155
11	0.50	30	0.50	30	0.40	22	....	180	....	360	1.65	150
12	0.50	30	0.50	30	0.50	30	....	180	....	310	1.65	150
13	Ice	30	Ice	30	0.50	30	....	190	2.45	260	1.60	145
14	Ice	30	0.60	38	0.50	30	....	190	3.00	350	1.70	155
15	0.60	38	0.50	30	0.70	46	2.00	200	2.90	330	1.75	160
16	0.60	38	0.40	22	0.70	46	2.00	200	2.60	285	1.75	160
17	0.60	38	0.40	22	0.80	55	2.20	225	2.40	255	1.70	155
18	0.60	38	0.40	22	0.80	55	2.10	210	2.50	270	1.90	185
19	0.60	38	0.60	38	0.80	55	2.20	225	2.90	330	1.70	155
20	0.60	38	0.50	30	0.80	55	2.50	270	3.75	470	1.70	155
21	0.50	30	0.60	38	0.90	65	2.20	225	3.25	385	1.60	145
22	0.50	30	0.50	30	0.90	65	2.00	200	3.50	430	1.45	125
23	0.50	30	0.50	30	1.00	75	....	190	3.20	380	1.40	120
24	0.50	30	0.40	22	1.00	75	1.90	185	2.70	300	1.35	110
25	0.50	30	0.40	22	1.00	75	1.90	185	2.80	315	1.30	105
26	0.50	30	0.40	22	1.10	85	2.00	200	2.45	260	2.55	440
27	Ice	30	0.40	22	0.90	65	2.00	200	2.25	230	2.85	320
28	Ice	30	0.40	22	0.90	65	1.80	170	2.45	260	2.50	270
29	Ice	30	....	....	0.80	55	2.00	200	2.45	260	2.25	230
30	Ice	30	....	....	0.80	55	2.25	230	2.10	210	2.00	200
31	Ice	30	....	....	1.00	75	....	....	2.00	200	....	....

	July.		August.		September.		October.		November.		December.	
1	1.75	160	1.10	85	0.55	34						
2	1.60	145	1.05	80	0.57	36						
3	1.50	130	1.15	90	0.50	30						
4	1.70	155	1.10	85	0.50	30						
5	1.45	125	....	70	0.50	30						
6	1.30	105	....	70	0.60	38						
7	....	130	....	60	0.57	36						
8	....	150	....	60	0.70	46						
9	....	180	0.80	55	0.80	55						
10	2.10	210	0.77	52	0.70	46						
11	2.00	200	0.72	48	0.60	38						
12	2.20	225	0.70	46	0.57	36						
13	2.75	305	0.67	44	0.57	36						
14	3.20	380	0.65	42	0.70	46						
15	Back water	470	0.62	40	0.77	52						
16		550	0.62	40	0.80	55						
17	3.60	450	0.65	42	0.85	60						
18	3.10	365	0.65	42	0.80	55						
19	2.45	260	0.87	62	0.85	60						
20	....	230	0.77	52	0.77	52						
21	....	200	0.70	46	0.70	46						
22	1.75	160	0.67	44	0.67	44						
23	1.65	150	0.62	40	0.65	42						
24	1.45	125	0.60	38	0.60	38						
25	1.40	120	0.60	38	0.60	38						
26	1.40	120	0.57	36	0.57	36						
27	1.25	100	0.55	34	0.55	34						
28	1.25	100	0.52	32	0.52	32						
29	1.20	95	0.50	30	0.50	30						
30	1.20	95	0.50	30	....	30						
31	1.15	90	0.52	32	....	....						

Monthly Discharge of Little Clearwater Creek 5 Miles above Mouth for 1915.

(Drainage area, 84 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	38	30	34	0.40	0.46	2,090
February	38	22	29	0.34	0.35	1,610
March.	85	22	45	0.53	0.61	2,770
April	270	85	187	2.22	2.48	11,130
May	470	200	316	3.75	4.32	19,400
June	440	105	180	2.14	2.39	10,730
July..	550	90	203	2.41	2.78	12,480
August	90	30	50	0.59	0.68	3,070
September	60	30	41	0.49	0.55	2,440
The period.	550	22	120.5	1.43	14.62	65,720

LOUIS CREEK.—(2023).

Location.—Section 33, township 23, range 15, west 6th meridian.

Records Available.—July 16 to October 31, 1911; April 1 to November 16, 1912; May 1 to October 14, 1913; April 1 to December 11, 1914; April 1 to September 30, 1915.

Drainage Area.—One hundred square miles.

Gauge.—Standard vertical staff gauge read daily by D. G. McKnight.

Channel.—The width of stream averages 25 to 35 feet at measuring section. The section seems to be shifting somewhat.

Discharge Measurements.—Twelve measurements made during 1911-12-13-14-15 seem to indicate a gradual scouring at the control from year to year. The low part of the rating curve used for 1915 is determined from 1915 measurements.

Winter Flow.—Ice conditions obtain on this stream usually throughout January, February and March.

Accuracy.—The accuracy of the results is somewhat impaired by the shifting channel.

Discharge Measurements of Louis Creek near Railway Belt Boundary.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
April 30	Cline & Dann	1,046	26	49	1.7	1.50	94
May 16	E. M. Dann	1,044	31	108	4.0	3.80	439
May 29	E. M. Dann	1,044	28	90	3.6	3.20	328
June 8	E. M. Dann	1,044	28	82	3.4	2.72	276
June 9	E. M. Dann	1,044	28	85	3.4	2.81	288
Aug. 22	H. J. E. Keys	1,057	30	19	2.8	1 02	52
1913							
June 28	H. J. E. Keys	1,057	33	58	2.6	2.10	155
1914							
Aug. 13	C. B. Corbould	1,915	21	27	1.0	0.59	28
1915							
April 15	F. R. Archibald	1,673	36	22	2.3	0.82	51
May 13	F. R. Archibald	1,673	41	58	2 9	1.82	168

Daily Gauge Height and Discharge of Louis Creek near Railway Belt Boundary for 1915.

(Drainage area, 100 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.40	15	1.35	96	1.77	145	2.02	175	1.30	91	0.60	29
2	0.40	15	1.35	96	1.70	135	1.82	150	1 25	86	0.60	29
3	0.50	22	1.47	110	1.57	120	1.70	135	1.20	81	0.60	29
4	0.57	26	1.55	115	1.50	110	1.62	125	1.10	71	0.60	29
5	0.60	29	1 60	120	1.45	105	1.45	105	1.05	66	0.60	29
6	0.60	29	1.72	135	1.45	105	1.40	100	1.00	62	0.60	29
7	0.65	33	1.92	160	1.65	130	1.37	98	0.95	57	0.60	29
8	0.70	37	2.17	190	1.50	110	1.30	91	0.90	53	0.60	29
9	0.65	33	2.20	195	1.42	105	1.27	88	0.90	53	0.60	29
10	0.60	29	2 50	235	1.32	93	1.32	93	0.85	49	0.60	29
11	0.65	33	2.12	185	1.27	88	1.37	98	0.80	45	0.60	29
12	0.75	41	1.92	160	1.20	81	1.35	96	0.80	45	0.60	29
13	0.85	49	1.87	155	1.40	100	1.55	120	0.75	41	0.60	29
14	0.85	49	2.97	300	1.45	105	1.50	110	0.75	41	0.70	37
15	0.80	45	3.40	365	1.37	98	1.95	165	0.70	37	0.80	45
16	0.90	53	3.02	310	1 30	91	2 52	240	0.70	37	0.75	41
17	1.05	66	2.77	275	1.62	125	2.22	200	0.75	41	0.70	37
18	1.12	73	2.77	275	1.57	120	1.97	165	0.80	45	0.70	37
19	1.25	86	3.22	340	1.50	110	1.85	155	0.95	57	0.70	37
20	1.40	101	3.45	375	1.52	115	1.65	130	0.80	45	0.70	37
21	1.30	91	3.05	315	1.47	110	1.57	120	0.75	41	0.65	33
22	1.20	81	2.77	275	1.35	96	1.47	110	0.75	41	0.65	33
23	1.10	71	2.55	245	1.25	86	1.37	98	0.70	37	0.65	33
24	1.15	76	2.50	235	1.27	88	1.30	91	0.70	37	0.65	33
25	1.15	76	2.60	250	1.27	88	1.30	91	0.70	37	0.65	33
26	1.25	86	2.30	210	2.75	270	1.32	93	0.70	37	0.60	29
27	1.25	86	2.15	190	3.35	360	1.40	101	0.65	33	0.60	29
28	1.25	86	2.20	195	2.75	270	1.35	96	0.60	29	0.60	29
29	1.45	105	2.05	175	2.37	220	1.30	91	0.60	29	0.60	29
30	1.42	100	1.87	155	2.17	195	1.30	91	0.60	29	0.60	29
31	......	......	1.80	145	......	......	1.20	81	0.60	29	......	......

Monthly Discharge of Louis Creek near Railway Belt Boundary for 1915.

(Drainage area, 100 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	105	15	57	0.57	0 64	3,390
May	375	96	213	2.13	2 46	13,100
June	360	81	132	1.32	1 47	7,850
July	240	81	119	1.19	1.37	7,320
August	91	29	48	0.48	0 55	2,950
September	45	29	32	0.32	0.36	1,900
The period	375	15	100	1.00	6 85	36,510

LYONS DIVERSION FROM EDWARDS CREEK.—(2083).

Location.—Near Edwards creek, in section 34, township 22, range 16, west of 6th meridian.

Records Available.—April 13 to September 30, 1915.

Gauge.—Vertical staff read by H. Devick.

Discharge Measurements.—Two in 1915.

Accuracy.—Results quite reliable except for discharges above 1.0 cubic foot per second.

Discharge Measurements of Lyons Diversion from Edwards Creek.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 13	F. R. Archibald	1,673	1.5	0.3	0.7	0.15	0.2
May 11	F. R. Archibald	1,673	2.0	0.5	2.2	0.20	1.1

Daily Gauge Height and Discharge of Lyons Diversion from Edwards Creek for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1				Dry								Dry
2									0.20	1.0		
3					0.15	0.2						
4								Dry				
5										Dry		
6					0.10	0.1						
7												
8												
9				Dry								
10			0.25	2.5	0.10	0.1						
11			0.25	2.5								
12												
13	0.15	0.2			0.10	0.1				Dry		Dry
14			0.25	2.5								
15												
16			0.30	4.0	0.10	0.1		Dry				
17												
18	0.10	0.1										
19												
20			0.20	1.0								
21	0.05	0.1				Dry						
22							0.15	0.2				
23			0.20	1.0								
24												
25	0.25	2.5					0.15					
26												
27			0.15	0.2			0.15	0.2				
28	0.12	0.1					0.15	0.2				
29												
30		Dry				Dry				Dry		Dry
31			0.20	1.0								

MONTE CREEK, BELOW DIVERSION TO SUMMIT LAKE.—(2025).

Location.—Section 22, township 18, range 14, west 6th meridian.

Records Available.—May 25 to September 30, 1911; April 1 to September 17, 1912; June 20 to September 30, 1913; April 1 to November 17, 1914; April 1 to September 30, 1915.

Drainage Area.—Forty-five square miles.

Gauge.—Standard vertical staff gauge read daily by E. C. Lewis.

Channel.—Width of channel averages 10 feet. Bed of stream gravelly and permanent.

Discharge Measurements.—Fourteen measurements made during 1912-13-14-15 indicate a shift in the channel. Only the 1915 measurements have been used to locate the lower part of the rating curve.

Winter Flow.—Ice conditions generally prevail throughout winter months.

Accuracy.—There is a certain amount of indefiniteness about the location of the rating curve between discharges of 20 and 60 cubic feet per second. The curve is quite indefinite above 80 cubic feet per second also, but the discharge only exceeded that amount for two days.

Discharge Measurements of Monte Creek below Diversion to Summit Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
May 11	C. E. Richardson	1,048	15	24.7	3.0	4.70	73.3
July 15	C. E. Richardson	1,048	13	9.1	0.5	3.98	4.9
July 17	C. E. Richardson	1,048	12	7.3	0.4	3.93	2.9
Aug. 27	C. E. Richardson	1,048	13	4.2	0.4	3.74	1.6
1913							
April 24	H. J. E. Keys	1,057	14	13.2	0.8	4.17	11.0
June 20	H. J. E. Keys	1,057	14	11.9	1.1	4.18	12.8
Sept. 19	H. J. E. Keys	1,057	6	2.4	0.8	3.80	1.9
1914							
June 22	C. B. Corbould	1,915	13	8.7	0.5	4.00	4.7
July 22	C. B. Corbould	1,915	12	7.5	0.4	3.93	3.1
Sept. 23	C. B. Corbould	1,915	11	5.8	0.2	3.83	0.9
1915							
Mar. 24	F. R. Archibald	1,673	14	6.3	0.3	3.96	1.8
June 16	A. L. McNaughton	1,915	13	10.9	0.9	4.18	10.0
July 5	Tredcroft & McNaughton	1,915	13	9.1	0.9	4.10	8.1
Oct. 9	A. L. McNaughton	1,055	4	0.8	1.0	3.80	0.7

Daily Gauge Height and Discharge of Monte Creek below Diversion to Summit Lake for 1915.

(Drainage area, 45 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.70	0.5	4.30	18.4	4.00	3.5	3.90	1.6	3.80	0.7	3.70	0.5
2	3.80	0.7	4.30	18.4	4.05	5.2	3.85	1.1	3.80	0.7	3.70	0.5
3	3.90	1.6	4.30	18.4	4.10	7.0	3.80	0.7	3.80	0.7	3.70	0.5
4	3.85	1.1	4.30	18.4	4.10	7.0	3.90	1.6	3.80	0.7	3.70	0.5
5	3.80	0.7	4.30	18.4	4.00	3.5	4.05	5.2	3.80	0.7	3.70	0.5
6	3.80	0.7	4.25	14.9	4.00	3.5	4.10	7.0	3.80	0.7	3.70	0.5
7	3.85	1.1	4.22	12.9	4.10	7.0	4.10	7.0	3.80	0.7	3.70	0.5
8	3.90	1.6	4.27	16.3	4.20	11.5	4.10	7.0	3.80	0.7	3.70	0.5
9	3.80	0.7	4.30	18.4	4.15	9.2	4.10	7.0	3.80	0.7	3.70	0.5
10	3.80	0.7	4.20	11.5	4.15	9.2	4.05	5.2	3.80	0.7	3.70	0.5
11	3.80	0.7	4.17	10.1	4.15	9.2	4.00	3.5	3.80	0.7	3.70	0.5
12	3.90	1.6	4.10	7.0	4.15	9.2	4.05	5.2	3.80	0.7	3.70	0.5
13	3.95	2.5	4.20	11.5	4.10	9.2	4.05	5.2	3.80	0.7	3.75	0.6
14	4.00	3.5	4.22	12.9	4.17	10.1	4.00	3.5	3.80	0.7	3.80	0.7
15	4.00	3.5	4.30	18.4	4.17	10.1	4.00	3.5	3.75	0.6	3.80	0.7
16	4.10	7.0	4.20	11.5	4.15	9.2	3.90	1.6	3.70	0.5	3.80	0.7
17	4.02	4.2	4.20	11.5	4.25	14.9	3.90	1.6	3.80	0.7	3.80	0.7
18	4.50	42.0	4.30	18.4	4.20	11.5	3.90	1.6	3.80	0.7	3.80	0.7
19	4.50	42.0	4.41	29.0	4.20	11.5	3.90	1.6	3.80	0.7	3.80	0.7
20	4.50	42.0	4.46	36.0	4.20	11.5	3.90	1.6	3.80	0.7	3.80	0.7
21	4.00	3.5	4.40	28.0	4.17	10.1	3.90	1.6	3.80	0.7	3.80	0.7
22	4.23	13.5	4.30	18.4	4.15	9.2	3.90	1.6	3.70	0.5	3.80	0.7
23	4.35	23.0	4.30	18.4	4.17	10.1	3.85	1.1	3.70	0.5	3.80	0.7
24	4.35	23.0	4.20	11.5	4.20	11.5	3.80	0.7	3.70	0.5	3.80	0.7
25	4.35	23.0	4.20	11.5	4.37	25.0	3.80	0.7	3.70	0.5	3.80	0.7
26	4.30	18.4	4.10	7.0	4.92	112.0	3.80	0.7	3.70	0.5	3.80	0.7
27	4.30	18.4	4.10	7.0	5.17	157.0	3.80	0.7	3.70	0.5	3.80	0.7
28	4.30	18.4	4.10	7.0	4.73	78.0	3.80	0.7	3.70	0.5	3.80	0.7
29	4.32	20.0	4.02	4.2	4.33	21.0	3.80	0.7	3.70	0.5	3.80	0.7
30	4.30	18.4	4.00	3.5	4.05	5.2	3.80	0.7	3.70	0.5	3.80	0.7
31	....	....	4.00	3.5	....	....	3.80	0.7	3.70	0.5		

Monthly Discharge of Monte Creek below Diversion to Summit Lake for 1915.

(Drainage area, 45 square miles.)

Month	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	42.0	0.5	11.2	....	....	666
May	36.0	3.5	14.6	....	....	898
June	157.0	3.5	20.4	....	....	1,214
July	7.0	0.7	2.7	....	....	166
August	0.7	0.5	0.6	....	....	37
September	0.7	0.5	0.6	....	....	36
The period	157.0	0.5	8.3	....	....	3,017

MONTE CREEK, ABOVE BOSTOCK'S DIVERSION.—(2024).

Location.—Section 25, township 19, range 15, west 6th meridian.

Records Available.—May 20 to June 30, 1911; August 8, 1911; April 8 to September 7, 1912; April 16 to September 13, 1913; April 1 to December 4, 1914; April 7 to September 30, 1915.

Drainage Area.—One hundred and ten square miles.

Gauge.—Standard vertical staff gauge read semi-weekly by T. F. Teagle.

Channel.—About 15 feet wide, with rocky bed.

Discharge Measurements.—Seventeen measurements made during 1911-12-13-14-15 agree fairly well and cover the whole range of stage.

Winter Flow.—Ice conditions prevail during December, January and February.

Accuracy.—Gauge readings are only taken twice a week, which tends to lessen the accuracy of the results.

Discharge Measurements of Monte Creek above Bostock's Diversion.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
May 20	C. E. Richardson	1,048	15.0	16.7	1.4	1.45	23.1
May 20	C. G. Cline	1,044	15.0	19.4	1.2	1.45	24.2
June 28	C. E. Richardson	1,048	8.5	6.9	0.6	0.86	3.7
Aug. 8	C. E. Richardson	1,048	6.0	2.4	0.4	0.60	1.0
1912							
May 8	C. E. Richardson	1,048	15.0	26.8	1.20	1.50	32.9
May 9	C. E. Richardson	1,048	16.0	31.2	1.30	1.57	39.6
May 15	C. E. Richardson	1,048	18.0	39.4	2.20	2.05	88.8
July 15	C. E. Richardson	1,048	8.5	6.7	0.80	1.05	5.3
1913							
April 22	H. J. E. Keys	1,057	13.0	12.9	1.30	1.35	17.5
June 17	H. J. E. Keys	1,057	14.0	8.1	1.40	1.23	11.4
1914							
May 7	E. H. Tredcroft	1,055	22.0	28.4	1.71	1.70	48.6
June 21	C. B. Corbould	1,915	10.0	11.4	0.54	0.90	6.2
July 21	C. B. Corbould	1,915	8.0	7.6	0.32	0.70	2.5
Sept. 22	C. B. Corbould	1,915	7.5	2.9	0.66	0.59	1.9
1915							
Mar. 26	F. R. Archibald	1,673	10.0	2.4	0.81	0.72	2.0
May 21	F. R. Archibald	1,673	10.5	12.4	1.94	1.30	23.9
Oct. 9	A. L. McNaughton	1,055	4.0	0.8	0.66	0.50	0.5

Daily Gauge Height and Discharge of Monte Creek above Bostock's Diversion for 1915.

(Drainage area, 110 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.70	2.8	1.12	13.1	....	9.0	....	30.0	....	3.0	0.45	0.5
2	....	3.6	....	13.0	0.98	8.3	....	20.0	....	3.0	....	0.5
3	0.81	4.4	....	12.7	....	7.0	1.19	16.1	....	3.0	....	1.0
4	....	4.2	....	12.5	....	6.0	....	13.0	0.70	2.8	0.53	1.1
5	....	4.0	1.10	12.3	0.84	5.0	....	10.0	....	2.5	....	1.0
6	....	3.5	....	12.0	....	5.0	....	8.0	....	2.5	....	1.0
7	0.72	3.1	....	10.0	....	5.5	0.87	5.6	0.65	2.3	....	0.5
8	....	3.0	1.02	9.6	....	6.0	....	5.0	....	2.0	0.45	0.5
9	....	2.9	....	9.5	0.90	6.2	....	5.0	....	2.0	....	0.5
10	0.70	2.8	....	9.0	....	6.0	0.82	4.6	....	2.0	....	1.0
11	....	3.0	....	8.5	....	6.0	....	4.5	0.60	1.8	0.52	1.0
12	....	3.5	0.97	8.1	0.90	6.2	....	4.5	....	1.8	....	1.0
13	....	4.0	....	8.5	....	6.0	....	4.5	....	1.5	....	1.0
14	0.82	4.6	....	9.0	....	6.0	0.82	4.6	0.57	1.5	....	1.5
15	....	4.5	1.01	9.2	....	6.0	....	5.0	....	1.5	0.60	1.8
16	....	4.5	....	11.0	0.90	6.2	....	5.0	....	1.5	....	1.0
17	0.81	4.4	....	13.0	....	7.0	0.85	5.2	....	1.8	....	1.0
18	....	4.4	....	16.0	....	9.0	....	4.0	0.60	1.8	0.40	0.2
19	....	4.5	1.21	17.0	1.02	9.6	....	4.0	....	1.8	....	0.2
20	....	4.6	....	18.0	....	9.5	....	4.0	....	2.0	....	0.2
21	0.82	4.6	....	20.0	....	9.5	0.72	3.1	0.62	2.0	....	0.3
22	....	5.0	1.30	21.0	....	9.0	....	3.5	....	2.0	0.42	0.3
23	....	6.0	....	20.0	1.00	8.9	....	4.0	....	1.5	....	1.0
24	0.91	6.5	....	19.0	....	9.0	0.80	4.2	....	1.0	....	1.5
25	....	8.0	....	18.0	....	10.0	....	4.0	0.50	0.8	0.60	1.8
26	....	9.0	1.21	17.0	1.05	10.6	....	4.0	....	0.8	....	1.5
27	....	10.0	....	15.0	....	18.0	....	3.5	....	0.8	....	1.5
28	1.06	10.9	....	12.0	....	25.0	0.75	3.5	0.50	0.8	....	1.0
29	....	12.0	1.05	10.6	....	32.0	....	3.5	....	0.5	0.45	0.5
30	....	12.0	....	10.0	1.58	39.0	....	3.0	....	0.5	....	0.5
31	....	....	....	9.0	....	....	0.72	3.1	....	0.5	.	..

Monthly Discharge of Monte Creek above Bostock's Diversion for 1915.

(Drainage area, 110 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	10.9	2.8	5.3			320
May	21.0	8.1	13.0			800
June	39.0	6.2	10.2			610
July	16.1	3.1	6.6			410
August	2.8	0.8	1.7			100
September	1.8	0.2	0.9			50
The period	39.0	0.2	6.3			2,290

NOTE.—There are other diversions in the upper part of the watershed.

MURTLE RIVER.—(2069).

Location.—At the Clearwater trail crossing, 15 miles below Murtle lake and about 50 miles by trail from the Canadian Northern Railway, at Raft River. post office. A 50-mile trip by pack trail is necessary after leaving the railway

Records Available.—Gauge readings have been taken since September 1914, which will be available when the station is completely rated.

Drainage Area.—Only part of the watershed of the Murtle river has been surveyed, and there is hardly enough data available to make a close estimate of the drainage area.

Gauge.—A Gurley Automatic Water Stage Register was installed in November 1915. This gauge prints the stage to the nearest hundredth of a foot every 15 minutes. Before November, a chain gauge was in use, read four times a week by P. McDougall.

Channel.—The bed of the stream is composed of rocks and gravel and is very smooth and even. The water is quite swift.

Discharge Measurements.—Three measurements have been made during 1914 and 1915 which locate the rating curve for low stages. A cable car was erected in May 1915 and it will now be possible to get high water measurements.

Accuracy.—The results computed should be fairly accurate. In future, with an automatic gauge and a cable car, it should be possible to get very precise results.

Discharge Measurements of Murtle River 20 Miles above Helmcken Falls.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
Sept. 1	Tredcroft & Corbould	1,923	254	321	2.6	3.10	850
1915							
Aug. 8	E. H. Tredcroft	1,923	272	507	3.1	3.82	1,610
Nov. 20	A. L. McNaughton	1,915	250	297	2.2	2.83	650

NOTE.—All measurements are referred to the datum of the Automatic Gauge installed in November, 1915.

Daily Gauge Height and Discharge of Murtle River above Helmcken Falls for 1914.

Day.	July		August		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1							3.70	1,460				
2					3.1	850						
3												
4											3.05	810
5											3.05	810
6												
7									3.35	1,080		
8												
9					3.1	850						
10							3.50	1,240				
11											3.15	900
12											3.15	900
13												
14					3.1	850			3.25	980		
15												
16							3.40	1,130				
17												
18									3.15	900		
19											Ice	
20												
21												
22												
23					3.3	1,030	3.45	1,180				
24												
25					3.3	1,030						
26									3.05	810		
27												
28											Ice	
29							3.40	1,130	3.05	810		
30												
31												

Daily Gauge Height and Discharge of Murtle River above Helmcken Falls for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1					2.70	550			4.25		5.55	
2												
3											5.40	
4	3.05	810					2.80	620			5.35	
5	3.05	810	Ice									
6			Ice									
7					2.50							
8					2.50							
9									5.15			
10												
11												
12											4.85	
13			Ice								4.95	
14	2.85	650	Ice						5.55			
15	2.85	650			2.60				5.55		4.80	
16					2.50		3.40	1,130	5.55		4.85	
17							3.50	1,240	5.50			
18							3.60	1,350	5.40		4.70	
19							3.65	1,400			4.75	
20							3.70	1,460				
21	2.85	650	Ice		2.50		3.75	1,520			4.60	
22	2.85	650	Ice				3.80	1,580			4.65	
23							3.80	1,580				
24							3.85	1,640				
25												
26											5.80	
27									5.75		5.75	
28	Ice		2.75		2.50				5.80			
29					2.50							
30							4.35				4.55	
31									5.55			

	July.		August.		September.		October.		November.		December.	
1	4.45						2.85	650				
2			4.00	1,840	3.25	980	2.85	650	3.10	850		
3			4.00	1,840	3.22	960			3.05	810		
4	4.35											
5	4.30		3.85	1,640								
6			3.85	1,640	3.17	910						
7			3.80	1,580	3.15	890	2.75	580	3.05	810		
8			3.80	1,580			2.75	580	3.05	810		
9			3.75	1,520	3.05	810			3.00	770		
10					3.05	810	2.72	560				
11							2.70	550	2.95	730		
12	4.45		3.55	1,300								
13	4.45		3.65	1,400					2.90	690		
14					3.00	770						
15					3.00	770						
16			3.50	1,240								
17			3.55	1,300	2.98	750						
18	5.05				2.95	730	2.80	620				
19	5.00						2.85	650	2.84	650		
20			3.42	1,150					2.83	640		
21			3.45	1,180	2.90	690						
22					2.90	690	2.95	730				
23	4.35		3.37	1,100			2.95	730				
24	4.30		3.40	1,130	2.85	650						
25					2.85	650						
26	4.25											
27	4.25		3.30	1,030			3.15	890				
28	4.25		3.32	1,050			3.15	890				
29	4.20				2.80	620						
30			3.30	1,030	2.80	620						
31			3.28	1,010								

NOTE.—Station not completely rated this season.

NORTH THOMPSON RIVER.—(2085).

Location.—Forty miles north of Kamloops and one mile above the mouth of Barriere river: Provincial Water District No. 2.

Records Available.—June 1 to December 31, 1915.

Drainage Area.—Above gauging station, about 7,000 square miles. Above mouth, about 7,400 square miles.

Gauge.—Chain gauge on highway bridge read daily by A. C. Champion.

Channel.—Stream confined by bridge abutments, velocity moderate at all stages.

Discharge Measurements.—Made from highway bridge. Five measurements have been made during 1915 and the winter months of 1916, and the discharge curve is well defined between gauge heights 2.0 and 5.0 and between 10.0 and 11.0. At other stages the curve is not so well defined and the figures for the discharge less accurate.

Discharge Measurements of North Thompson River above Barriere River.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 15	E. H. Tredcroft..............	1,923	307	2,730	1.04	2.93	2,860
Aug. 13	E. H. Tredcroft..............	1,923	366	4,840	4.15	10.93	20,100
Sept. 1	E. H. Tredcroft..............	1,923	374	4,790	4.32	10.70	20,700
1916							
Mar. 28	A. L. McNaughton...........	1,923	315	2,934	1.20	3.63	3,488
April 6	C. G. Cline & A. L. McNaughton	1,923	311	3,141	1.48	4.16	4,664

Daily Gauge Height and Discharge of North Thompson River above Barriere River for 1915.

(Drainage area, 7,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1											12.0	23,600
2											11.8	23,100
3											11.6	22,550
4											11.4	22,050
5											11.3	21,800
6											11.4	22,050
7											11.6	22,550
8											12.1	23,850
9											12.1	23,850
10											11.6	22,550
11											10.9	20,750
12											10.4	19,450
13											10.3	19,200
14											10.4	19,450
15											10.7	20,200
16											11.1	21,250
17											11.7	22,800
18											12.3	24,400
19											12.2	24,100
20											11.8	23,100
21											11.6	22,550
22											11.5	22,300
23											11.3	21,800
24											11.3	21,800
25											11.5	22,300
26											11.8	23,100
27											13.4	27,250
28											13.1	26,450
29											12.6	25,150
30											12.3	24,400
31											......	......

	July.		August.		September.		October.		November.		December.	
1	12.1	23,850	12.0	23,600	10.5	19,700	4.8	6,060	6.1	9,040	3.6	3,670
2	12.1	23,850	12.1	23,850	10.7	20,200	5.0	6,500	5.9	8,560	3.4	3,340
3	12.0	23,600	12.2	24,100	9.1	15,250	5.2	6,980	5.6	7,840	3.4	3,340
4	12.0	23,600	12.7	25,400	8.9	15,750	5.1	6,740	5.5	7,600	3.4	3,340
5	12.0	23,600	12.4	24,650	8.9	15,750	5.0	6,500	5.3	7,220	3.4	3,340
6	12.1	23,850	11.9	23,350	8.8	15,500	4.8	6,060	5.2	6,980	3.5	3,500
7	12.5	24,900	11.5	22,300	8.5	14,800	4.7	5,840	5.2	6,980	3.6	3,670
8	12.3	24,400	11.5	22,300	7.9	13,350	4.6	5,620	5.1	6,740	3.6	3,670
9	12.2	24,100	11.5	22,300	7.5	12,400	4.4	5,190	4.9	6,280	3.6	3,670
10	12.2	24,100	11.4	22,050	7.0	11,200	4.3	4,980	4.7	5,840	3.5	3,500
11	12.2	24,100	11.3	21,800	6.7	10,480	4.2	4,800	4.5	5,400	3.5	3,500
12	12.0	23,600	11.3	21,800	6.4	9,760	4.1	4,600	4.5	5,400	3.4	3,340
13	11.7	22,800	11.1	21,250	6.0	8,800	4.1	4,600	4.2	4,780	3.4	3,340
14	11.8	23,100	10.9	20,750	5.8	8,320	4.1	4,600	4.1	4,600	3.4	3,340
15	12.1	23,850	10.9	20,750	5.6	7,840	4.2	4,800	4.1	4,600	3.4	3,340
16	13.3	27,000	10.9	20,750	5.6	7,840	4.2	4,800	4.2	4,800	3.4	3,340
17	14.0	28,800	10.8	20,500	5.6	7,840	4.2	4,800	4.2	4,800	3.3	3,190
18	13.5	27,500	10.8	20,500	5.6	7,840	4.3	4,980	4.2	4,800	3.2	3,050
19	12.9	25,900	....	20,200	5.8	8,320	4.5	5,400	4.2	4,800	Ice	3,000
20	12.5	24,900	....	20,200	5.9	8,560	5.3	7,220	4.1	4,600	....	3,000
21	12.2	24,100	....	20,200	6.0	8,800	5.2	6,980	4.0	4,400	....	3,000
22	12.3	24,400	10.6	19,950	5.9	8,560	5.1	6,740	3.9	4,200	....	3,000
23	12.5	24,900	10.6	19,950	5.7	8,080	5.3	7,220	3.9	4,200	....	3,000
24	12.4	24,650	10.5	19,700	5.6	7,840	5.4	7,460	3.8	4,030		3,000
25	11.9	23,350	10.5	19,700	5.4	7,460	5.4	7,460	3.8	4,030		3,000
26	11.8	23,100	10.5	19,700	5.2	6,980	5.6	7,840	3.9	4,200		3,000
27	11.7	22,800	10.3	19,200	5.1	6,740	5.6	7,840	3.9	4,200		3,000
28	11.7	22,800	10.3	19,200	5.0	6,500	5.1	9,040	3.8	4,030		3,000
29	11.7	22,800	10.3	19,200	4.9	6,280	6.5	10,000	3.8	4,030		3,000
30	11.8	23,100	10.3	19,200	4.8	6,060	6.5	10,000	3.7	3,850	....	3,000
31	11.8	23,100	10.5	19,700	....	....	6.3	9,520	....	....	Ice	3,000

Monthly Discharge of North Thompson River above Barriere River for 1915.

(Drainage area, 7,000 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	27,250	19,200	22,660	3.23	2.60	1,347,500
July	28,800	22,800	24,210	3.45	3.98	1,489,000
August	25,400	19,200	21,230	3.03	3.49	1,305,000
September	20,200	6,060	10,460	1.50	1.67	623,000
October	10,000	4,600	6,490	0.93	1.07	398,440
November	9,040	3,850	5,428	0.78	0.87	333,750
December	3,670	3,000	3,240	0.46	0.53	199,220
The period	28,800	3,000	13,388	1.91	15.21	5,695,910

PAUL CREEK.—(2032).

Location.—Section 31, township 20, range 16, west 6th meridian.

Records Available.—July 1 to October 6, 1911; May 12 to September 25, 1912; May 18 to September 30, 1913; April 20 to September 27, 1914; April 25 to September 30, 1915.

Drainage Area.—Sixty-five square miles.

Gauge.—Vertical staff gauge read weekly by E. L. Ridout.

Channel.—Channel is rocky, and current is very swift at high stages.

Discharge Measurements.—The gauge height curve is fairly well defined except at very low stages (below 10 cubic feet per second discharge). The flow is artificially controlled by a dam on Paul lake.

Winter Flow.—Stream usually dries up during winter, or ice conditions obtain.

Accuracy.—Some uncertainty in regard to low water discharges; gauge readings only once a week.

Discharge Measurements of Paul Creek below Paul Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 27	E. M. Dann	1,505	5.5	4.60	9.02	2.25	41.4
May 19	C. B. Corbould	1,673	5.7	6.05	11.50	2.75	69.9
July 14	C. B. Corbould	1,915	7.0	2.70	5.50	1.95	14.8
July 25	Dann & Webb	1,915	5.8	1.98	6.44	1.73	12.7
Aug. 8	C. B. Corbould	1,915	6.0	3.26	7.90	2.12	25.7
1915							
May 28	A. L. McNaughton	1,915	5.8	4.06	6.53	2.10	26.4
Aug. 3	McNaughton & Mason	1,915	5.8	2.63	6.40	1.90	16.8

NOTE.—The flow of Paul creek is regulated by the storage dam at Paul lake.

Daily Gauge Height and Discharge of Paul Creek near Paul Lake for 1915.

(Drainage area, 65 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	2.30	36	....	25	....	11	1.75	12	1.70	11
2	....	....	....	33	....	27	....	12	....	12	....	10
3	....	....	....	30	....	30	....	13	....	13	....	9
4	....	....	....	27	....	32	1.80	14	....	13	....	8
5	....	....	....	25	....	35	....	17	....	13	1.50	7
6	....	....		22	2.35	40	....	22	....	13	....	7
7	....	....	....	20	....	35	....	25	....	14	....	6
8	....	....	....	17	....	30	....	27	1.80	14	....	6
9	....	....	1.85	15	....	25	....	30	....	12	....	6
10	....	....	....	17	....	20	....	33	....	10	....	6
11	....	....	....	20	....	15	2.30	36	....	7	....	5
12	....	....	....	23	....	10	....	36	1.30	5	1.30	5
13	....	....	....	25	1.60	9	....	36	....	8	....	5
14	....	....	....	27	....	9	....	36	....	10	....	5
15	....	....	....	30	....	8	....	37	1.75	12	....	5
16	....	....	2.25	33	....	8	....	37	....	12	....	5
17	....	....	....	33	....	8	....	37	....	12	....	5
18	....	....	....	34	....	8	2.32	37	....	12	....	5
19	....	....	....	34	....	7	....	36	....	12	1.30	5
20	....	....	....	35	1.50	7	....	35	....	12	....	5
21	....	....	....	35	....	7	....	32	....	12	....	5
22	....	....	....	36	....	7	....	30	1.75	12	....	5
23	....	....	2.30	36	....	7	....	27	....	12	....	4
24	....	....	....	34	....	7	....	25	....	12	....	4
25	2.30	36	....	32	....	7	2.00	20	....	12	....	4
26	....	....	....	30	....	7	....	18	....	12	1.20	4
27	....	....	....	27	1.45	7	....	17	....	12	....	4
28	....	....	....	25	....	8	....	16	....	11	....	4
29	....	....	....	22	....	9	....	15	....	11	....	4
30	....	....	2.00	20	....	10	....	14	....	11	....	4
31	....	....	....	22	....	....	....	13	....	11	....	....

Monthly Discharge of Paul Creek below Paul Lake for 1915.

(Drainage area, 65 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	36	15	27.6	0.40	0.56	1,700
June	40	7	15.5	0.24	0.27	920
July	36	14	25.5	0.39	0.45	1,570
August	14	5	11.5	0.18	0.21	710
September	11	4	5.6	0.09	0.10	330
The period	36	4	17.1	0.26	1.49	5,230

NOTE.—The flow in Paul creek is regulated by the storage dam on Paul lake.

RAFT RIVER.—(2055).

Location.—Raft river; Water District No. 2.

Records Available.—June 1, 1914, to December 14, 1914; February 21 to December 31, 1915.

Drainage Area.—Three hundred square miles.

Gauge.—Standard chain gauge on highway bridge, graduated in feet and tenths, having a range from 3.0 to 9.0 and read by J. McLennan, Raft River P.O.

Channel.—Average width of channel 150 feet. Bed of stream composed of rock, sand and gravel, and permanent.

Discharge Measurements.—Six measurements made during 1914 and 1915 agree very closely and cover practically the entire range of stage for 1915.

Winter Flow.—Ice conditions obtain on this river during the latter part of December, throughout January, and during the first half of February.

Accuracy.—The results for 1915 should be quite reliable at all stages except for discharges below 40 cubic feet per second.

Discharge Measurements of Raft River 1 Mile from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
June 2	E. H. Tredcroft	1,923	109	494	5.47	8.00	2,703
July 26	E. H. Tredcroft	1,923	80	135	2.05	4.35	277
Aug. 28	E. H. Tredcroft	1,923	67	72	1.18	3.55	85
1915							
April 27	E. H. Tredcroft	1,923	108	322	4.17	6.25	1,340
May 24	E. H. Tredcroft	1,923	106	480	5.70	8.05	2,760
Oct. 26	A. L. McNaughton	1,915	73	121	2.31	4.20	280

Daily Gauge Height and Discharge of Raft River 1 Mile from Mouth for 1915.

(Drainage area, 300 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......		......	3.0	20	4.2	235	6.1	1,240	6.2	1,310
2		......		......	3.1	30	4.4	295	6.2	1,300	6.0	1,170
3		......		......	3.2	40	4.9	500	6.6	1,600	5.9	1,100
4		......		......	3.2	40	6.1	1,240	6.8	1,750	5.8	1,030
5		......		......	3.2	40	5.9	1,100	6.9	1,830	5.8	1,030
6	......	......		......	3.1	30	5.7	960	7.5	2,300	5.7	960
7	......	......	......	......	3.0	20	5.65	930	7.8	2,540	6.2	1,310
8	......	......	......	......	2.9	10	5.6	890	7.8	2,540	5.9	1,100
9	......	......	......	......	3.0	20	5.6	890	8.1	2,780	5.7	960
10	......	......	......	......	3.2	40	5.4	770	8.6	3,190	5.5	830
11	......	......	......	......	3.3	50	5.4	770	7.8	2,540	5.3	710
12	......	......	......	......	3.3	50	5.6	890	6.9	1,830	5.3	710
13	......	......	......	......	3.3	50	6.0	1,170	6.8	1,750	5.2	650
14	......	......	......	......	3.35	57	6.1	1,240	6.8	1,750	5.2	650
15	......	......	......	......	3.5	80	6.0	1,170	6.8	1,750	5.2	650
16	......	......	......	......	3.7	115	6.2	1,310	6.7	1,680	5.3	710
17	......	......	......	......	3.8	135	6.5	1,530	6.6	1,600	5.3	710
18	......	......	......	......	3.8	135	6.6	1,600	6.6	1,600	5.2	650
19	......	......		......	3.8	135	6.8	1,750	7.2	1,060	5.2	650
20	......	......	......	......	3.8	135	6.8	1,750	7.5	2,300	5.2	650
21	......	......	3.0	20	3.85	145	6.3	1,380	7.7	2,460	4.9	500
22	......	......	3.0	20	4.0	180	6.0	1,170	8.0	2,700	4.8	455
23	......	......	3.0	20	4.2	235	6.0	1,170	8.0	2,700	4.6	370
24	......	......	3.2	40	4.3	265	6.1	1,240	7.8	2,540	4.4	295
25	......	......	3.3	50	4.4	295	6.1	1,240	7.3	2,140	4.3	265
26	......	......	3.2	40	4.3	265	6.2	1,310	6.9	1,830	5.7	960
27	......	......	3.1	30	4.2	235	6.15	1,270	6.6	1,600	5.5	830
28	......	......	2.9	10	4.0	180	6.0	1,170	6.8	1,750	5.3	710
29	......	......	......	......	3.9	155	6.2	1,310	6.6	1,600	5.1	605
30	......	......	......	......	3.9	155	7.05	1,940	6.3	1,380	5.0	555
31	......	......	......	......	4.0	180	......	......	6.2	1,310	......	......

	July.		August.		September.		October.		November.		December.	
1	4.9	500	......	250	3.3	50	3.60	95	4.20	235	3.90	155
2	4.7	410	4.2	235	3.3	50	3.70	115	......	220	3.80	135
3	4.6	370	4.2	235	3.3	50	3.70	115	4.10	205	3.80	135
4	4.6	370	4.2	235	3.25	45	3.60	95	4.00	180	3.70	115
5	4.5	330	4.2	235	3.25	45	3.60	95	3.90	155	3.60	95
6	4.5	330	4.1	205	3.25	45	3.50	80	3.80	155	3.50	80
7	4.4	295	4.1	205	3.25	45	3.50	80	3.90	155	3.60	95
8	4.3	265	4.0	180	3.30	50	3.60	95	3.85	145	3.60	95
9	4.4	295	3.9	155	3.30	50	3.60	95	3.80	135	3.60	95
10	4.9	500	3.7	115	3.30	50	3.50	80	3.70	115	3.50	80
11	4.9	500	3.7	115	3.35	57	3.50	80	3.70	115	3.50	80
12	5.0	550	3.6	95	3.40	65	3.50	80	3.80	135	3.50	80
13	5.4	770	3.6	95	3.40	65	3.50	80	4.00	180	3.60	95
14	5.9	1,100	3.5	80	3.50	80	3.60	95	3.90	155	3.60	95
15	6.5	1,530	3.5	80	3.50	80	3.65	105	3.90	155	3.60	95
16	7.0	1,900	3.5	80	3.60	95	3.65	105	3.80	135	3.70	115
17	6.5	1,530	3.6	95	3.70	115	3.65	105	3.70	115	3.70	115
18	6.1	1,240	3.6	95	3.70	115	3.70	115	3.70	115	3.60	95
19	5.7	960	3.6	95	3.60	95	4.30	265	3.60	95	3.60	95
20	5.5	830	3.5	80	3.60	95	4.00	180	3.50	80	3.50	80
21	5.3	710	3.5	80	3.55	87	4.00	180	3.70	115	3.40	65
22	5.2	650	3.5	80	3.55	87	4.30	265	3.70	115	3.40	65
23	5.2	650	3.5	80	3.50	80	4.40	295	3.70	115	3.00	20
24	4.8	455	3.5	80	3.50	80	4.30	265	3.70	115	2.90	10
25	......	430	3.5	80	3.90	65	4.20	235	3.60	95	......	10
26	4.7	410	3.4	65	3.40	65	4.20	235	3.60	95	......	10
27	4.5	330	3.4	65	3.40	65	5.00	550	3.60	95	......	10
28	4.4	295	3.4	65	3.40	65	4.60	370	3.80	135	Ice	10
29	4.4	295	3.4	65	3.35	57	4.40	295	3.80	135	..	10
30	4.3	265	3.35	57	3.30	50	4.30	265	3.70	115		10
31	4.3	265	3.35	57	......	......	4.20	235				10

Monthly Discharge of Raft River 1 Mile from Mouth for 1915.

(Drainage area, 300 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	295	10	114	0.38	0.44	7,000
April	1,940	235	1,140	3.80	4.24	67,800
May	3,190	1,240	1,998	6.66	7.68	122,800
June	1,310	265	769	2.56	2.86	45,800
July	1,900	265	624	2.08	2.40	38,400
August	250	57	120	0.40	0.46	7,400
September	115	45	68	0.23	0.26	4,000
October	550	80	172	0.57	0.66	10,600
November	235	80	137	0.46	0.51	8,100
December	155	10	73	0.24	0.28	4,500
The period	3,190	10	521.5	1.74	19.79	316,400

SALMON RIVER.—(2078).

Location.—Below the mouth of Bolean creek, section 2, township 18, range 12, west of the 6th meridian.

Records Available.—May 23 to December 31, 1911; January 1 to September 13, 1912; April 1 to September 30, 1915.

Drainage Area.—Three hundred and fifty square miles.

Gauge.—Vertical staff read daily by M. White.

Channel.—Stream confined between bridge abutments; water fairly swift.

Discharge Measurements.—Thirteen measurements made during 1911-12-13 and -15 agree fairly well and cover the whole range of stage.

Winter Flow.—Usually open water conditions obtained all winter.

Accuracy.—The results depend mainly on measurements made in previous years. The two made during 1915 agree fairly well with the old ones.

Discharge Measurements of Salmon River at Falkland.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
May 23	C. E. Richardson	1,648	30	96	4.4	8.37	422
May 23	C. G. Cline	1,046	30	94	4.3	8.37	407
June 16	W. M. Carlyle	1,044	30	74	3.2	7.68	238
July 11	W. M. Carlyle	1,044	30	64	2.8	7.50	176
July 25	W. M. Carlyle	1,044	30	44	1.6	7.00	72
Aug. 19	W. M. Carlyle	1,044	30	42	1.2	6.81	52
Aug. 21	W. M. Carlyle	1,044	29	42	1.2	6.80	49
1912							
May 13	C. E. Richardson	1,048	30	120	5.9	8.90	708
July 16	C. E. Richardson	1,048	29	58	2.7	7.25	155
Aug. 28	C. E. Richardson	1,049	24	34	1.5	6.80	51
1913							
April 23	H. J. E. Keys	1,057	29	63	2.5	7.30	152
1915							
Mar 25	F. R. Archibald	1,673	29	36	0.9	6.65	31
June 17	A. L. McNaughton	1,915	29	64	2.9	7.40	183

NOTE.—All measurements are referred to new gauge installed March 25, 1915.

Daily Gauge Height and Discharge of Salmon River at Falkland for 1915.

(Drainage area, 350 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gaug Heighte	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1							6.7	40	7.2	130	7.5	190
2							6.7	40	7.25	145	7.45	180
3							6.85	67	7.25	145	7.45	180
4							6.9	77	7.3	150	7.4	170
5							6.9	77	7.3	150	7.35	160
6							6.8	58	7.35	160	7.25	140
7							6.85	67	7.35	160	7.25	140
8							6.85	67	7.35	160	7.20	130
9							6.85	67	7.35	160	7.20	130
10							6.80	58	7.4	170	7.20	130
11							6.85	67	7.35	160	7.25	140
12							6.95	86	7.25	145	7.20	130
13							7.00	96	7.35	160	7.15	125
14							7.00	96	7.50	190	7.20	130
15							6.95	86	7.60	210	7.25	140
16							6.95	86	7.60	210	7.30	150
17							7.05	105	7.5	190	7.40	170
18							7.10	115	7.55	200	7.35	160
19							7.20	135	7.8	260	7.45	180
20							7.25	140	8.1	330	7.40	170
21							7.20	135	8.3	395	7.40	170
22							7.15	125	8.2	360	7.35	160
23							7.10	115	8.1	330	7.35	160
24							7.10	115	8.0	305	7.3	150
25							7.05	105	7.9	280	7.25	140
26							7.15	125	7.75	245	8.2	360
27							7.15	125	7.65	225	8.35	415
28							7.15	125	7.60	210	8.25	380
29							7.20	135	7.55	200	8.25	380
30							7.25	140	7.5	190	8.20	360
31							....	....	7.5	190	....	....

	July.		August.		September.		October.		November.		December.	
1	8.15	350	7.10	115	6.75	49	6.80	58	6.75	49	6.70	40
2	8.10	330	7.10	115	6.75	49	6.80	58	6.75	49	6.70	40
3	7.95	295	7.15	125	6.75	49	6.75	49	6.75	49	6.70	40
4	7.85	270	7.15	125	6.75	49	6.80	58	6.75	49	6.70	40
5	7.75	250	7.20	130	6.75	49	6.75	49	6.75	49	6.75	49
6	7.60	210	7.10	115	6.75	49	6.75	49	6.75	49	6.70	40
7	7.60	210	7.00	96	6.75	49	6.75	49	6.75	49	6.70	40
8	7.45	180	6.95	86	6.75	49	6.75	49	6.75	49	6.70	40
9	7.45	180	6.95	86	6.75	49	6.75	49	6.70	40	6.75	40
10	7.40	170	6.90	77	6.80	58	6.75	49	6.70	40	6.70	40
11	7.35	160	6.90	77	6.80	58	6.75	49	6.70	40	6.70	40
12	7.35	160	6.85	67	6.80	58	6.75	49	6.70	40	6.70	40
13	7.50	190	5.85	67	6.80	58	6.80	58	6.75	49	6.70	40
14	7.50	190	6.85	67	6.85	68	6.85	68	6.75	49	6.70	40
15	7.65	220	6.80	58	6.90	77	6.80	58	6.75	49	6.70	40
16	7.50	190	6.80	58	6.85	68	6.80	58	6.70	40	6.70	40
17	7.45	180	6.90	77	6.80	58	6.75	49	6.70	40	6.70	40
18	7.45	180	6.90	77	6.75	49	6.75	49	6.70	40	6.70	40
19	7.40	170	6.90	77	6.75	49	6.75	49	6.70	40	6.65	31
20	7.30	150	6.90	77	6.75	49	6.75	49	6.70	40	6.65	31
21	7.25	140	6.90	77	6.75	49	6.75	49	6.70	40	6.70	40
22	7.20	130	6.85	67	6.75	49	6.75	49	6.70	40	6.70	40
23	7.15	125	6.80	58	6.75	49	6.75	49	6.70	40	6.70	40
24	7.10	115	6.80	58	6.80	58	6.75	49	6.70	40	6.70	40
25	7.05	105	6.80	58	6.80	58	6.80	58	6.70	40	6.70	40
26	7.10	115	6.80	58	6.75	49	6.85	68	6.70	40	6.65	31
27	7.15	125	6.75	49	6.75	49	6.85	68	6.70	40	6.65	31
28	7.10	115	6.75	49	6.75	49	6.80	58	6.70	40	6.75	49
29	7.10	115	6.75	49	6.75	49	6.80	58	6.70	40	6.80	58
30	7.10	115	6.75	49	6.75	49	6.75	49	6.70	40	Ice	50
31	7.20	130	6.75	49	....	....	6.75	49	....	....	Ice	50

Monthly Discharge of Salmon River at Falkland for 1915.

(Drainage area, 350 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	140	40	96	0.27	0.30	5,710
May	395	130	210	0.60	0.69	12,910
June	415	125	191	0.55	0.61	11,360
July	350	105	179	0.51	0.59	11,000
August	130	49	77	0.22	0.25	4,730
September	77	49	53	0.15	0.17	3,150
October	68	49	53	0.15	0.17	3,260
November	49	40	43	0.12	0.13	2,560
December	58	31	41	0.12	0.14	2,250
The period	415	31	105	0.30	3.05	57,200

SIWASH CREEK.—(2058).

Location.—Section 12, township 22, range 16, west 6th meridian.

Records Available.—June 7 to July 28, 1914; April 1 to September 30, 1915. (Records for 1915 are given herein; preceding records are tabulated in a previous report.)

Drainage Area.—Seven square miles.

Gauge.—Standard vertical staff gauge installed above Cippoletti weir and read daily by J. S. Wardell.

Channel.—Straight above weir. Velocity, medium.

Discharge Measurements.—Weir formula used for calculating discharges. Two meter measurements made during 1915 agree fairly well with the weir results.

Winter Flow.—Stream usually runs dry in the fall.

Accuracy.—Accuracy of results compiled from weir discharge table should be quite high.

Discharge Measurements of Siwash Creek near Heffley Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 14	F. R. Archibald	1,673	6.5	4.0	0.23	2.8	0.9
May 12	F. R. Archibald	1,673	7.0	5.0	0.50	2.9	2.5

NOTE.—Measurements made to check results from weir formula.

Daily Gauge Height and Discharge of Siwash Creek near Heffley Lake for 1915.

(Drainage area, 7 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	0.1	3.00	3.8	3.00	3.8	3.00	3.8	2.85	2.0	2.60	0.1
2	....	0.1	3.00	3.8	3.00	3.8	2.95	3.2	2.80	1.5	2.60	0.1
3	2.60	0.1	3.00	3.8	2.95	3.2	2.95	3.2	2.80	1.5	2.60	0.1
4	2.60	0.1	3.00	3.8	2.95	3.2	2.95	3.2	2.80	1.5	2.60	0.1
5	2.60	0.1	3.00	3.8	2.90	2.6	2.90	2.6	2.80	1.5	2.60	0.1
6	2.60	0.1	3.00	3.8	2.90	2.6	2.90	2.6	2.80	1.5	2.60	0.1
7	2.65	0.4	3.00	3.8	2.90	2.6	2.90	2.6	2.75	1.1	2.60	0.1
8	2.65	0.4	2.95	3.2	2.90	2.6	2.85	2.1	2.75	1.1	2.60	0.1
9	2.65	0.4	2.95	3.2	2.90	2.6	2.85	2.1	2.75	1.1	2.60	0.1
10	2.65	0.4	2.95	3.2	2.90	2.6	2.85	2.1	2.75	1.1	2.60	0.1
11	2.65	0.4	2.95	3.2	2.90	2.6	2.85	2.1	2.70	0.7	2.60	0.1
12	2.70	0.7	2.90	2.6	2.85	2.1	2.85	2.1	2.70	0.7	2.60	0.1
13	2.75	1.1	2.92	2.8	2.85	2.1	2.90	2.6	2.70	0.7	2.60	0.1
14	2.80	1.5	3.00	3.8	2.85	2.1	2.90	2.6	2.65	0.4	2.65	0.4
15	2.80	1.5	3.12	5.5	2.85	2.1	3.00	3.8	2.65	0.4	2.65	0.4
16	2.92	2.8	3.25	7.5	2.85	2.1	3.20	6.7	2.65	0.4	2.65	0.4
17	2.97	3.4	3.15	5.9	2.90	2.6	3.00	3.8	2.65	0.4	2.60	0.1
18	3.02	4.1	3.15	5.9	2.90	2.6	2.90	2.6	2.65	0.4	2.60	0.1
19	3.05	4.5	3.32	8.7	2.90	2.6	2.90	2.6	2.70	0.7	2.60	0.1
20	3.05	4.5	3.50	12.0	2.90	2.6	3.00	3.8	2.65	0.4	2.60	0.1
21	3.05	4.5	3.40	10.2	2.90	2.6	2.95	3.2	2.65	0.4	2.60	0.1
22	3.00	3.8	3.35	9.3	2.90	2.6	2.90	2.6	2.65	0.4	2.60	0.1
23	3.00	3.8	3.27	7.8	2.85	2.1	2.90	2.6	2.65	0.4	2.60	0.1
24	3.00	3.8	3.20	6.7	2.90	2.6	2.85	2.1	2.65	0.4	2.65	0.4
25	3.00	3.8	3.25	7.5	2.85	2.1	2.85	2.1	2.65	0.4	2.65	0.4
26	3.00	3.8	3.15	5.9	2.95	3.2	2.90	2.6	2.60	0.1	2.60	0.1
27	3.00	3.8	3.10	5.1	3.35	9.3	2.90	2.6	2.60	0.1	2.60	0.1
28	3.00	3.8	3.10	5.1	3.25	7.5	2.90	2.6	2.60	0.1	2.60	0.1
29	3.00	3.8	3.00	3.8	3.15	5.9	2.85	2.1	2.60	0.1	2.60	0.1
30	3.00	3.8	2.95	3.2	2.95	3.2	2.85	2.1	2.60	0.1	2.60	0.1
31	....	....	2.90	2.6	....	....	2.85	2.1	2.60	0.1	....	....

Monthly Discharge of Siwash Creek near Heffley Lake for 1915.

(Drainage area, 7 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April.	4.5	0.1	2.2	0.31	0.35	131
May.	12.0	2.6	5.2	0.74	0.85	320
June. .	9.3	2.1	3.2	0.46	0.51	190
July. .	6.7	2.1	2.8	0.40	0.46	172
August. .	2.0	0.1	0.7	0.10	0.11	43
September. . .	0.4	0.1	0.1	0.21	0.24	9
The period. .	12.0	0.1	2.4	0.37	2.52	865

THREE MILE CREEK.—(2080).

Location.—Section 23, township 20, range 21, west 6th meridian: Water District No. 2.

Records Available.—Gauge readings from June 21 to September 30, 1915.

Drainage Area.—Fifty-five square miles.

Gauge.—Standard 3-foot staff read daily by L. Harris.

Channel.—Gravel and large stones; fairly permanent; water generally less than one foot deep.

Discharge Measurements.—Three measurements made during 1915 only cover part of the range of stage. High and low water measurements required.

Accuracy.—Discharges between 3 and 8 cubic feet per second are probably quite reliable.

Discharge Measurements of Three Mile Creek near Savona for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
June 4	A. L. McNaughton	1,915	9.5	4.6	0.85	0.90	3.9
July 21	A. L. McNaughton	1,915	10.7	5.1	1.31	1.00	6.6
Aug. 27	A. L. McNaughton	1,915	10.3	5.0	1.00	0.96	5.0

Daily Gauge Height and Discharge of Three Mile Creek near Savona for 1915.
(Drainage area, 55 square miles.)

Day.	June.		July.		August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			1.40		1.10	7.9	1.00	5.8				
2			1.40		1.10	7.9	1.00	5.8				
3			1.40		1.00	5.8	1.00	5.8				
4	0.90		1.40		1.00	5.8	1.00	5.8				
5			1.30		1.00	5.8	1.00	5.8				
6			1.30		1.00	5.8	1.00	5.8				
7			1.30		1.00	5.8	1.00	5.8				
8			1.20		1.00	5.8		5.8				
9			1.10	7.9	1.30		1.00	5.8				
10			1.10	7.9	1.30		1.00	5.8				
11					1.30		1.00	5.8				
12			1.10	7.9	1.30		1.00	5.8				
13			1.10	7.9	1.30		1.00	5.8				
14			1.20		1.30		1.00	5.8				
15			1.20		1.30		0.90	4.1				
16			1.20		1.30			4.1				
17			1.10	7.9	1.30			4.1				
18			1.10	7.9	1.30		0.90	4.1				
19			1.10	7.9	1.30		0.80	2.7				
20			1.00	5.8	1.30		0.80	2.7				
21	1.40		1.00	5.8	1.30		0.80	2.7				
22			1.00	5.8	1.10	7.9	0.80	2.7				
23	1.40		0.90	4.1	1.00	5.8	0.75					
24	1.40		0.90	4.1	1.00	5.8	0.75					
25	1.40		1.10	7.9	1.00	5.8	0.75					
26			1.20		1.00	5.8	0.75					
27			1.20		1.00	5.8	0.75					
28			1.20		1.00	5.8	0.75					
29			1.20		1.00	5.8	0.75					
30			1.20		1.00	5.8	0.75					
31					1.00	5.8						

NOTE.—Station only partly rated as yet.

TRANQUILLE RIVER.—(2043).

Location.—Section 36, township 20, range 19, west 6th meridian.

Records Available.—July 4 to October 21, 1911; March 29 to September 7, 1912; May 1 to October 31, 1913; May 3 to November 14, 1914; April 1 to September 30, 1915.

Drainage Area.—Two hundred and thirty square miles.

Gauge.—Standard vertical staff read daily by Eug. Cooney.

Channel.—Straight at the gauge section, about 20 feet wide. Bed of stream composed of stone and boulders and control is good.

Discharge Measurements.—Gauge height discharge curve was well defined for 1914 and assumed unchanged for 1915.

Winter Flow.—Ice conditions prevail during December, January and February.

Accuracy.—No measurements during 1915. Section apparently remained unchanged from 1911 to 1914 and it is assumed it did not change during 1915.

Discharge Measurements of Tranquille River above Diversions.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
July 4	C. G. Cline	1,046	14	17.7	1.1	0.94	19
Sept. 11	C. G. Cline	1,046	13	9.4	0.2	0.60	2
1912							
April 3	Cline & Dann	1,046	11	15.2	1.2	0.96	18
May 7	E. M. Dann	1,044	34	59.2	7.7	2.50	456
May 12	E. M. Dann	1,044	36	74.5	7.7	2.70	576
May 25	E. M. Dann	1,044	34	52.0	6.0	2.10	314
June 1	E. M. Dann	1,044	21	30.5	4.5	1.52	136
Aug. 2	H. J. E. Keys	1,057	13	10.3	2.0	0.88	21
Sept. 10	H. J. E. Keys	1,057	18	19.2	1.7	1.01	33
1913							
May 5	H. J. E. Keys	1,057	28	29.0	4.0	1.43	115
May 30	H. J. E. Keys	1,057	18	45.8	5.2	2.02	237
1914							
May 30	C. B. Corbould	1,915	18	31.0	4.2	1.35	132
Aug. 4	C. B. Corbould	1,915	15	14.5	0.6	0.65	9

Daily Gauge Height and Discharge of Tranquille River above Diversions for 1915.

(Drainage area, 230 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.80	15	1.30	80	1.25	70	1.48	120	0.97	27	0.62	7
2	0.82	16	1.30	80	1.27	75	1.40	100	0.95	25	0.62	7
3	0.90	20	1.30	80	1.20	60	1.30	80	0.92	22	0.62	7
4	0.92	22	1.30	80	1.17	55	1.25	70	0.90	20	0.62	7
5	0.95	25	1.35	90	1.12	50	1.17	55	0.87	19	0.62	7
6	0.95	25	1.37	95	1.12	50	1.12	50	0.85	18	0.62	7
7	1.00	30	1.40	100	1.12	50	1.10	45	0.85	18	0.62	7
8	1.02	34	1.42	105	1.10	45	1.05	40	0.82	16	0.62	7
9	1.02	34	1.37	95	1.05	40	1.05	40	0.80	15	0.62	7
10	1.02	34	1.35	90	1.05	40	1.05	40	0.77	14	0.62	7
11	1.07	41	1.37	95	1.05	40	1.02	35	0.77	14	0.62	7
12	1.12	50	1.27	75	1.05	40	1.02	35	0.75	13	0.62	7
13	1.20	60	1.22	65	1.05	40	1.02	35	0.72	11	0.62	7
14	1.25	70	1.40	100	1.05	40	1.05	40	0.70	10	0.65	8
15	1.25	70	1.60	150	1.05	40	1.25	70	0.70	10	0.67	9
16	1.30	80	1.65	150	1.02	35	1.40	100	0.70	10	0.67	9
17	1.40	100	1.62	155	1.10	45	1.35	90	0.75	13	0.65	8
18	1.45	110	1.62	155	1.20	60	1.28	75	0.75	13	0.65	8
19	1.50	125	1.95	250	1.17	55	1.22	65	0.77	14	0.65	8
20	1.60	150	2.20	340	1.22	65	1.15	50	0.80	15	0.62	7
21	1.55	135	2.05	280	1.20	60	1.10	45	0.75	13	0.62	7
22	1.52	130	2.00	265	1.15	50	1.02	35	0.72	11	0.62	7
23	1.47	120	1.75	190	1.10	45	1.00	30	0.70	10	0.62	7
24	1.45	115	1.65	160	1.10	45	0.92	22	0.67	9	0.65	8
25	1.40	100	1.62	155	1.07	40	0.97	27	0.67	9	0.62	7
26	1.42	105	1.52	130	1.60	150	0.97	27	0.67	9	0.62	7
27	1.40	100	1.47	110	2.10	300	0.97	27	0.67	9	0.62	7
28	1.35	90	1.35	90	1.95	250	1.00	30	0.65	8	0.60	7
29	1.37	95	1.35	90	1.80	205	1.00	30	0.62	7	0.60	7
30	1.35	90	1.30	80	1.60	150	1.00	30	0.62	7	0.60	7
31	....	....	1.27	75	....	....	0.97	27	0.62	7	....	....

Monthly Discharge of Tranquille River above Diversions for 1915.

(Drainage area, 230 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April....	135	15	73	0.32	0.36	4,340
May...	340	65	131	0.57	0.66	8,060
June..	300	35	76	0.33	0.37	4,520
July....	120	22	50	0.22	0.25	3,140
August...	27	7	13	0.06	0.07	800
September....	9	7	7	0.03	0.03	420
The period....	340	7	58	0.25	1.74	21,280

WHITEWOOD CREEK.—(2066).

Location.—Twenty-five miles north of Kamloops, on the west bank of the North Thompson river; Water District No. 2.

Records Available.—September 1 to December 12, 1914; March 10 to September 30, 1915.

Drainage Area.—Twenty-five square miles.

Gauge.—Vertical staff read daily by G. Mayson.

Channel.—Rocky; water fairly swift.

Discharge Measurements.—Three measurements made during 1914 and 1915 define the lower part of the curve up to a discharge of 9 cubic feet per second.

Accuracy.—Discharges above 9 cubic feet per second are subject to considerable uncertainty.

Discharge Measurements of Whitewood Creek 2 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
Aug. 25	Corbould & Tredcroft....	1,923	5.0	1.6	1.04	0.54	1.7
1915							
Mar. 9	E. H. Tredcroft.......	1,923	4.5	2.3	0.45	0.74	1.0
May 4	E. H. Tredcroft.......	1,923	8.0	8.1	1.06	1.40	8.6

Daily Gauge Height and Discharge of Whitewood Creek 2 Miles from Mouth for 1914.

(Drainage area, 25 square miles.)

Day.	September.		October.		November.		December.					
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
2	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
3	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
4	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
5	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
6	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
7	0.70	0.8	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......
8	0.70	0.8	0.65	0.5	0.90	2.3	1.00	3.2	......	......	......	......
9	0.70	0.8	0.65	0.5	0.90	2.3	1.00	3.2	......	......	......	......
10	0.70	0.8	0.65	0.5	0.90	2.3	1.00	3.2	......	......	......	......
11	0.70	0.8	0.75	1.1	0.90	2.3	1.00	3.2	......	......	......	......
12	0.70	0.8	0.80	1.5	0.90	2.3	1.00	3.2	......	......	......	......
13	0.70	0.8	0.80	1.5	0.90	2.3	......	......	......	......	......	......
14	0.70	0.8	0.80	1.5	0.90	2.3	......	......	......	......	......	......
15	0.70	0.8	0.80	1.5	0.90	2.3	......	......	......	......	......	......
16	0.70	0.8	0.80	1.5	0.90	2.3	......	......	......	......	......	......
17	0.75	1.1	0.80	1.5	0.90	2.3	......	......	......	......	......	......
18	0.80	1.5	0.85	2.0	0.95	2.8	......	......	......	......	......	......
19	0.80	1.5	0.90	2.3	1.00	3.2	......	......	......	......	......	......
20	0.80	1.5	0.90	2.3	1.00	3.2	......	......	......	......	......	......
21	0.75	1.1	0.90	2.3	1.00	3.2	......	......	......	......	......	......
22	0.75	1.1	0.90	2.3	1.00	3.2	......	......	......	......	......	......
23	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
24	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
25	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
26	0.70	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
27	......	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
28	......	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
29	......	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
30	......	0.8	0.90	2.3	1.00	3.2	......	......	......	......	......	......
31	.	....	0.90	2.3	....	....	......	......	......	......	......	......

Monthly Discharge of Whitewood Creek 2 Miles from Mouth for 1914.

(Drainage area, 25 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
September........	1.5	0.8	0.9	0.04	0.04	540
October.......	2.3	0.8	1.6	0.06	0.07	980
November....	3.2	2.3	2.7	0.10	0.11	1,610
The period	3.2	0.8	1.7	0.07	0.22	3,130

Daily Gauge Height and Discharge of Whitewood Creek 2 Miles from Mouth for 1915.

(Drainage area, 25 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1							0.80	1.5	1.40	8.6	1.52	10.9
2							0.80	1.5	1.40	8.6	1.50	10.4
3							0.80	1.5	1.40	8.6	1.50	10.4
4							0.85	1.9	1.40	8.6	1.45	9.5
5							0.90	2.3	1.40	8.6	1.40	8.6
6							0.92	2.5	1.40	8.6	1.40	8.6
7							0.95	2.8	1.40	8.6	1.40	8.6
8							1.00	3.2	1.40	8.6	1.40	8.6
9					....	....	1.00	3.2	1.42	9.0	1.35	7.8
10					0.75	1.1	1.00	3.2	1.42	9.0	1.35	7.8
11					0.75	1.1	1.02	3.5	1.42	9.0	1.35	7.8
12					0.75	1.1	1.02	3.5	1.45	9.5	1.35	7.8
13					0.75	1.1	1.05	3.8	1.45	9.5	1.30	6.9
14					0.75	1.1	1.10	4.3	1.47	9.9	1.35	7.8
15					0.75	1.1	1.17	5.1	1.47	9.9	1.35	7.8
16					0.75	1.1	1.22	5.8	1.60	12.5	1.30	6.9
17					0.75	1.1	1.27	6.5	1.65	13.6	1.30	6.9
18					0.75	1.1	1.30	6.9	1.70	14.7	1.35	7.8
19					0.75	1.1	1.32	7.2	1.70	14.7	1.40	8.6
20					0.75	1.1	1.35	7.8	1.80	16.9	1.40	8.6
21					0.75	1.1	1.35	7.8	1.77	16.3	1.40	8.6
22					0.75	1.1	1.35	7.8	1.77	16.3	1.40	8.6
23					0.75	1.1	1.37	8.1	1.75	15.8	1.40	8.6
24					0.75	1.1	1.37	8.1	1.75	15.8	1.40	8.6
25					0.80	1.5	1.40	8.6	1.72	15.1	1.40	8.6
26					0.80	1.5	1.40	8.6	1.70	14.7	1.40	8.6
27					0.80	1.5	1.40	8.6	1.65	13.6	1.50	10.4
28					0.80	1.5	1.40	8.6	1.62	12.9	1.60	12.5
29					0.80	1.5	1.40	8.6	1.60	12.5	1.70	14.7
30					0.80	1.5	1.40	8.6	1.55	11.5	1.70	14.7
31					0.80	1.5	....	....	1.55	11.5	....	....

	July.		August.		September.		October.		November.		December.	
1	....	13.6	1.40	8.6	0.87	2.0						
2	1.60	12.5	1.40	8.6	0.87	2.0						
3	1.60	12.5	1.40	8.6	0.87	2.0						
4	1.50	10.4	1.35	7.8	0.87	2.0						
5	1.40	8.6	1.30	7.0	0.82	1.6						
6	1.40	8.6	1.30	7.0	0.80	1.5						
7	1.37	8.1	1.25	6.2	0.80	1.5						
8	1.37	8.1	1.20	5.5	0.80	1.5						
9	1.37	8.1	1.20	5.5	0.80	1.5						
10	1.40	8.6	1.20	5.5	0.80	1.5						
11	1.40	8.6	1.15	4.9	0.80	1.5						
12	1.40	8.6	1.10	4.3	0.80	1.5						
13	1.40	8.6	1.10	4.3	0.80	1.5						
14	1.40	8.6	1.10	4.3	0.80	1.5						
15	1.50	10.4	1.10	4.3	0.80	1.5						
16	1.70	14.7	1.10	4.3	0.80	1.5						
17	1.70	14.7	1.07	4.0	0.80	1.5						
18	1.70	14.7	1.07	4.0	0.80	1.5						
19	1.70	14.7	1.07	4.0	0.80	1.5						
20	1.65	13.6	1.07	4.0	0.80	1.5						
21	1.60	12.5	1.07	4.0	0.80	1.5						
22	1.55	11.5	1.02	3.5	0.80	1.5						
23	1.50	10.4	1.00	3.2	0.80	1.5						
24	1.50	10.4	1.00	3.2	0.80	1.5						
25	1.45	9.5	0.95	2.8	0.80	1.5						
26	1.40	8.6	0.95	2.8	0.80	1.5						
27	1.40	8.6	0.90	2.3	0.80	1.5						
28	1.40	8.6	0.90	2.3	0.80	1.5						
29	1.45	9.5	0.90	2.3	0.77	1.3						
30	1.40	8.6	0.90	2.3	0.77	1.3						
31	1.40	8.6	0.90	2.3	....	....						

Monthly Discharge of Whitewood Creek 2 Miles from Mouth for 1915.

(Drainage area, 25 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	8.6	1.5	5.4	0.22	0.24	320
May	16.9	8.6	11.7	0.47	0.54	720
June	14.7	6.9	9.1	0.36	0.40	540
July	14.7	8.1	10.4	0.42	0.48	640
August	8.6	2.3	4.6	0.18	0.21	283
September	2.0	1.3	1.6	0.06	0.07	95
The period	16.9	1.3	7.13	0.28	1.94	2.898

OKANAGAN DISTRICT.

ADAMS RIVER.—(2000).

Location.—Section 6, township 23, range 12, west 6th meridian.

Records Available.—July and August 1911; and continuous records since January 1, 1912.

Drainage Area.—One thousand six hundred square miles.

Gauge.—Gurley Automatic Gauge installed October 17, 1914, to replace vertical staff gauge previously in use. The frequent changes of the gates in the dam at the outlet of the lake made it difficult to get reliable results without an automatic gauge.

Channel.—The meter measurements are made just above the dam where the channel is suitable; width from 300 to 500 feet, with velocity less than 3.0 feet per second. The gauge is located below the dam with a permanent natural control and swift water.

Discharge Measurements.—Twelve meter measurements taken during 1911, -13-14-15, well distributed over the whole range of stage except for discharges above 6000 cubic feet per second.

Winter Flow.—Even in very cold weather the river does not seem to freeze over at the gauge, nor does the water freeze in the gauge well, so that open water conditions obtain all winter.

Accuracy.—With a rating curve very well defined except for very high discharges and an automatic gauge recording the stage to the nearest hundredth of a foot every fifteen minutes, the records should be exceptionally accurate. The recorded flow, however, is not the natural flow of the stream, as it is regulated by the storage dam at the outlet of the lake.

Discharge Measurements of Adams River below Adams Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Nov. 8	Richardson & Carlyle......	1,055	330	1,770	0.3	1.24	484
Nov. 9	Richardson & Carlyle..	1,055	350	1,700	0.4	1.54	602
Nov. 9	Richardson & Carlyle.	1,055	350	1,720	1.2	3.29	1,960
Nov. 11	Richardson & Carlyle.	1,055	410	1,670	0.7	2.40	1,180
Dec. 12	Richardson & Carlyle	1,055	100	96	1.4	0.26	130
1913							
Aug. 19	C. E. Richardson.	1,048	162	2,078	2.4	5.40	5,009
Aug. 19	C. E. Richardson.	1,048	182	2,081	1.7	4.35	3,300
Aug. 19	C. E. Richardson. ..	1,048	172	2,087	1.5	4.40	3,280
Aug. 19	C. E. Richardson.....	1,048	442	2,096	1.0	3.60	2,220
1914							
July 3	E. H. Tredcroft...	1,923	443	2,355	2.4	5.40	5,650
1915							
Feb. 25	Tredcroft & Archibald...	1,923	306	871	0.3	0.74	272
July 3	Tredcroft & McNaughton	1,915	433	2,026	2.5	5.25	5,140

NOTE.—All measurements referred to datum of Automatic gauge.

Daily Gauge Height and Discharge of Adams River below Adams Lake for 1915.

(Drainage area, 1,600 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.10	930	0.80	290	0.74	275	1.01	370	4.19	3,030	5.45	5,380
2	2.07	900	0.80	290	0.74	275	1.00	370	4.25	3,100	5.40	5,270
3	2.07	900	0.80	290	0.74	275	1.02	370	4.31	3,180	5.35	5.160
4	2.06	900	0.79	290	0.74	275	1.06	390	4.37	3,260	5.32	5,050
5	2.04	900	0.79	290	0.74	275	1.09	410	4.43	3,420	5.27	4,940
6	2.02	860	0.78	290	0.74	275	1.14	430	4.49	3,500	5.22	4,840
7	2.00	860	0.78	290	0.75	275	1.18	450	5.54	3,580	5.21	4,840
8	1.95	830	0.77	275	0.75	275	1.18	450	4.57	3,580	5.22	4,840
9	1.39	530	0.76	275	0.75	275	1.19	450	4.61	3,660	5.18	4,840
10	0.71	260	0.74	275	0.76	275	1.21	450	4.66	3,740	4.98	4,420
11	0.72	260	0.74	275	0.76	275	1.25	470	4.73	3,920	4.97	4,310
12	0.72	260	0.74	275	0.78	290	1.30	490	5.02	4,420	4.93	4,310
13	0.72	260	0.73	275	0.79	290	1.33	520	6.04	6,930	4.90	4,210
14	0.72	260	0.73	275	0.83	310	1.36	520	5.95	6,640	4.91	4,210
15	0.72	260	0.73	275	0.83	310	2.95	1,600	5.94	6,640	4.92	4,210
16	0.72	260	0.73	275	0.83	310	3.65	2,300	5.84	6,390	4.92	4,210
17	0.72	260	0.73	275	0.85	310	3.67	2,300	5.78	6,260	5.01	4,420
18	0.72	260	0.73	275	0.85	310	3.69	2,360	5.70	6,000	4.53	3,580
19	0.73	275	0.73	275	0.92	330	3.73	2,420	5.67	5,870	3.81	2,480
20	0.73	275	0.74	275	0.94	350	3.76	2,420	5.66	5,870	3.87	2,540
21	0.74	275	0.74	275	0.92	330	3.80	2,480	5.67	5.870	3.92	2,610
22	0.78	290	0.74	275	0.92	330	3.82	2,480	5.68	6.000	3.96	2,680
23	0.80	290	0.74	275	0.94	350	3.85	2,540	5.69	6,000	4.39	3,340
24	0.80	290	0.74	275	0.93	350	3.84	2,540	5.68	6.000	4.71	3,830
25	0.81	290	0.74	275	0.87	310	3.83	2,540	5.66	5.870	4.33	3,260
26	0.82	290	0.74	275	0.88	330	3.89	2,610	5.63	5.870	4.39	3,340
27	0.82	290	0.74	275	0.91	330	3.95	2,680	5.58	5,740	4.47	3.420
28	0.82	290	0.74	275	0.95	350	4.01	2,750	5.50	5,620	4.53	3,580
29	0.79	290	....	....	0.97	350	4.07	2,820	5.54	5,620	4.71	3,830
30	0.78	290	....	....	1.00	370	4.13	2,960	5.54	5,620	5.32	5,050
31	0.79	290	....	....	1.00	370	....	....	5.51	5,500	....	....

	July.		August.		September.		October.		November.		December.	
1	5.30	5,050	4.32	3,180	3.88	2,610	1.85	770	2.61	1,306	2.02	875
2	5.29	5,050	3.89	2,610	3.85	2,540	1.85	770	2.82	1,480	2.02	875
3	5.25	4,940	3.91	2,610	3.83	2,540	1.85	770	2.87	1,536	2.02	875
4	5.22	4,840	3.94	2,680	3.81	2,480	1.84	770	2.85	1,522	2.01	870
5	5.18	4,840	3.97	2,680	3.11	1,750	1.85	770	2.23	1,020	2.01	870
6	5.15	4,730	3.98	2,750	2.41	1,150	1.85	770	2.11	940	2.03	880
7	5.14	4,730	3.97	2,680	2.42	1,150	1.86	780	2.23	1,020	2.54	1,250
8	5.13	4,730	3.98	2,750	2.42	1,150	1.87	780	2.08	920	2.70	1,380
9	4.74	3,920	3.99	2,750	2.43	1,170	1.87	780	2.12	940	2.76	1,430
10	4.37	3,260	3.99	2,750	2.42	1,150	1.88	790	2.13	950	2.72	1,400
11	4.37	3,260	3.98	2,750	2.41	1.150	1.87	780	2.16	970	2.81	1,480
12	4.42	3,340	3.98	2,750	2.39	1,130	1.87	780	2.17	980	2.39	1,130
13	4.45	3,420	3.98	2,750	2.37	1,110	1.88	790	2.16	970	2.61	1,300
14	4.48	3,500	3.97	2,680	2.35	1,110	1.90	800	2.16	970	2.55	1,260
15	4.53	3,580	3.97	2,680	3.24	1,900	1.91	810	2.17	980	2.79	1,460
16	5.08	4,630	3.96	2,680	3.31	1,950	1.92	810	2.20	1,000	3.04	1,690
17	5.39	5,270	3.98	2,750	3.68	2,360	1.93	820	2.13	950	2.96	1,610
18	5.48	5,500	3.99	2,750	4.38	3,340	1.79	750	2.16	970	2.75	1,425
19	5.88	0,520	3.99	2,750	4.14	2,960	1.80	750	2.19	990	2.80	1,470
20	6.13	7,270	3.99	2,750	3.73	2,420	1.81	750	2.24	1,030	1.67	675
21	6.04	6,920	3.98	2,750	4.05	2,820	1.83	760	2.21	1,010	1.68	680
22	5.96	6,640	3.99	2,750	3.21	1,850	1.85	760	2.17	980	1.69	690
23	5.91	6,520	3.99	2,750	3.00	1,650	1.95	830	2.12	940	1.69	690
24	3.84	6,390	3.99	2,750	3.40	2,050	2.51	1,230	2.16	970	1.68	680
25	5.80	6,260	3.98	2,750	3.22	1,850	1.89	790	2.19	990	1.69	690
26	5.67	5,870	3.98	2,750	1.87	780	1.91	810	2.24	1,030	1.69	690
27	5.59	5,740	3.97	2,680	3.33	2,000	1.92	810	2.27	1,050	1.69	690
28	5.53	5,620	3.94	2,680	2.90	1,560	1.95	830	2.70	1,375	1.70	690
29	5.09	4,630	3.92	2,610	1.80	750	1.98	850	2.00	860	1.70	690
30	4.87	4,110	3.90	2,010	1.85	780	2.01	870	2.02	875	1.72	700
31	4.84	4,110	3.89	2,010	....	....	2.03	880	....	....	1.79	740

Monthly Discharge of Adams River below Adams Lake for 1915.

(Drainage area, 1,600 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	930	260	441	0.28	0.32	27,100
February	290	275	279	0.17	0.18	15,500
March	370	275	310	0.19	0.22	19,100
April	2,960	370	1,531	0.96	1.07	91,100
May	6,930	3,030	5,055	3.16	3.64	311,000
June	5,380	2,480	4,100	2.56	2.86	244,000
July	7,270	3,260	5,006	3.13	3.61	308,000
August	3,180	2,610	2,723	1.70	1.96	167,000
September	3,340	750	1,774	1.11	1.24	105,500
October	1,230	750	807	0.50	0.58	49,600
November	1,536	860	1,051	0.66	0.74	62,500
December	1,690	675	1,027	0.64	0.74	63,100
The period	7,270	260	2,009	1.25	17.16	1,463,500

NOTE.—The run-off from Adams lake is regulated by a storage dam and the water is used for running logs down the river.

BOUNDARY CREEK.—(2048).

Location.—At Greenwood: Water District No. 4.

Records Available.—January 1 to December 7, 1914; February 21 to December 22, 1915.

Drainage Area.—One hundred and twenty-five square miles.

Gauge.—Vertical staff gauge graduated in feet and tenths, situated on upstream side of traffic bridge, read daily by P. A. McCarrach.

Channel.—Channel is straight for about 300 feet above and below measuring section. Bed of stream is rocky and permanent.

Discharge Measurements.—Six discharge measurements made during 1914 and 1915 show very good agreement and define the rating curve very well except for discharges between 100 and 250 and above 400 cubic feet per second.

Winter Flow.—Ice conditions exist during January and February.

Accuracy.—Except for the higher stages during the freshet, the results should be very accurate.

Discharge Measurements of Boundary Creek at Greenwood.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 20	C. E. Richardson	1,527	28	99.8	3.80	2.90	379
June 8	Dann & Chisholm	1,913	39	84.0	3.20	2.50	269
July 20	K. G. Chisholm	1,913	39	41.1	1.28	1.21	53
Aug. 26	K. G. Chisholm	1,913	17	15.6	0.77	0.77	12
1915							
Mar. 23	K. G. Chisholm	1,915	33	39.1	1.15	1.20	45
June 9	E. H. Tredcroft	1,923	37	79.7	3.43	2.50	273

Daily Gauge Height and Discharge of Boundary Creek at Greenwood for 1915.

(Drainage area, 125 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	0.82	14	1.62	90	2.80	350	3.20	460
2	....	....	....	....	0.85	17	1.82	115	2.90	380	3.10	435
3	....	....	....	....	0.85	17	2.37	230	2.82	350	2.95	390
4	....	....	....	....	0.85	17	2.40	245	2.72	325	2.90	380
5	....	....	....	....	0.85	17	2.40	245	2.66	310	2.80	350
6	....	....	....	....	0.90	20	2.38	240	2.60	300	2.70	325
7	....	....	....	....	0.90	20	2.42	245	2.60	300	2.70	325
8	....	....	....	....	0.90	20	2.50	270	2.65	310	2.60	300
9	....	....	....	....	0.90	20	2.40	245	2.65	310	2.60	300
10	....	....	....	....	0.90	20	2.42	245	2.65	310	2.50	270
11	....	....	....	....	0.85	17	2.42	245	2.77	350	2.40	245
12	....	....	....	....	0.85	17	2.57	285	2.50	270	2.30	215
13	....	....	....	....	0.85	17	2.80	350	2.45	255	2.20	190
14	....	....	....	....	0.90	20	2.75	340	2.82	350	2.20	190
15	....	....	....	....	0.90	20	2.65	310	2.80	350	2.15	180
16	....	....	....	....	0.95	24	2.72	325	2.70	325	2.10	170
17	....	....	....	....	0.95	24	2.85	365	2.70	325	2.10	170
18	....	....	....	....	1.00	28	2.95	395	2.97	395	2.05	160
19	....	....	....	....	1.00	28	3.00	405	3.45	530	2.05	160
20	....	....	....	....	1.00	28	3.05	420	3.42	530	2.05	160
21	....	....	0.80	14	1.00	28	2.90	380	3.50	545	2.00	150
22	....	....	0.80	14	1.10	36	2.72	325	3.70	600	1.90	135
23	....	....	0.80	14	1.11	36	2.62	300	....	570	1.80	115
24	....	....	0.80	14	1.23	50	2.57	280	3.50	545	1.80	115
25	....	....	0.80	14	1.35	60	2.50	270	3.50	545	1.70	105
26	....	....	0.80	14	1.39	66	2.45	255	3.35	500	1.70	105
27	....	....	0.80	14	1.38	66	2.39	245	3.20	465	1.70	105
28	....	....	0.80	14	1.35	60	2.39	245	3.25	480	1.70	105
29	....	....	....	....	1.35	60	2.65	310	3.35	500	1.65	96
30	....	....	....	....	1.42	66	2.80	350	3.50	550	1.60	90
31	....	....	....	....	1.55	84	....	....	3.35	500	....	....

	July.		August.		September.		October.		November.		December.	
1	1.60	90	....	80	0.80	14	0.80	14	0.90	20	0.80	14
2	1.60	90	....	80	0.80	14	0.80	14	0.90	20	0.80	14
3	1.60	90	....	80	0.80	14	0.80	14	0.90	20	0.80	14
4	1.65	96	....	70	0.80	14	0.80	14	0.90	20	0.80	14
5	1.60	90	....	70	0.70	9	0.80	14	0.90	20	0.80	14
6	1.60	90	....	70	0.70	9	0.80	14	0.90	20	0.80	14
7	1.70	105	....	60	0.70	9	0.80	14	0.90	20	0.80	14
8	1.60	90	....	60	0.70	9	0.80	14	0.90	20	0.80	14
9	1.80	115	....	60	0.70	9	0.80	14	0.90	20	0.85	17
10	1.70	105	1.30	55	0.70	9	0.80	14	0.90	20	0.85	17
11	1.60	90	1.28	55	0.70	9	0.80	14	0.90	20	0.85	17
12	1.60	90	1.20	45	0.70	9	0.85	17	0.85	17	0.85	17
13	1.60	90	1.20	45	0.80	14	0.90	20	0.85	17	0.85	17
14	1.65	95	1.20	45	0.90	20	0.90	20	0.85	17	0.85	17
15	1.70	105	1.20	45	0.90	20	0.90	20	0.85	17	0.80	14
16	1.70	105	1.20	45	0.90	20	0.90	20	0.85	17	0.80	14
17	1.70	105	1.18	43	0.90	20	0.85	17	0.85	17	0.80	14
18	1.70	105	1.16	41	0.90	20	0.87	18	0.85	17	0.80	14
19	1.70	105	1.15	40	0.90	20	0.87	18	0.85	17	0.80	14
20	1.65	95	1.15	40	0.90	20	0.87	18	0.85	17	0.80	14
21	1.70	105	1.10	36	0.90	20	0.87	18	0.85	17	0.80	14
22	1.70	105	1.00	28	0.90	20	0.87	18	0.85	17	0.80	14
23	1.70	105	1.00	28	0.80	14	0.87	18	0.85	17	Ice	
24	1.60	90	1.00	28	0.80	14	0.87	18	0.85	17	Ice	
25	1.50	80	1.00	28	0.80	14	0.90	20	0.85	17	Ice	
26	1.50	80	0.80	14	0.80	14	0.90	20	0.85	17	Ice	
27	1.50	80	1.00	28	0.80	14	0.90	20	0.85	17	Ice	
28	1.62	90	1.00	28	0.80	14	0.90	20	0.85	17	Ice	
29	1.52	80	1.00	28	0.80	14	0.90	20	0.85	17	Ice	
30	1.50	80	0.90	20	0.80	14	0.90	20	0.85	17	Ice	
31	1.50	80	0.80	14	....	....	0.90	20	....	....	....	

Monthly Discharge of Boundary Creek at Greenwood for 1915.

(Drainage area, 125 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	84	14	33	0.26	0.30	2,030
April	420	90	286	2.28	2.54	17,000
May	600	255	410	3.28	3.78	25,200
June	460	90	217	1.74	1.94	12,900
July	115	80	94	0.75	0.86	5,780
August	80	14	45	0.36	0.41	2,770
September	20	9	14	0.11	0.12	830
October	20	14	17	0.14	0.16	1,040
November	20	17	18	0.14	0.16	1,070
The period	600	9	126	1.01	10.27	68,620

BRASH CREEK.—(2070).

Location.—Section 27, township 18, range 8, west 6th meridian; Water District No. 2; above the intake of the Enderby waterworks system.

Records Available.—Regular records from October 28 to December 31, 1915; two meter measurements in April and September, 1915.

Drainage Area.—Ten square miles.

Gauge.—Standard vertical staff read twice a week by F. H. Hawes, for the city of Enderby.

Channel.—Boulders and gravel, water swift at high stages, control should be permanent.

Discharge Measurements.—Three measurements in 1915 are sufficient to locate the rating curve for the small range of stage during November and December.

Winter Flow.—Ice conditions exist during the three winter months.

Accuracy.—The results obtained for the last two months of the year should be quite reliable. The gauge is only read twice a week, but there were no marked fluctuations.

Co-operation.—Gauge readings are supplied by the city of Enderby.

Discharge Measurements of Brash Creek above Intake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 3	K. G. Chisholm	1,915	20	19.2	3.29	4.90	63.1
Sept. 8	A. L. McNaughton	1,915	9	3.2	0.87	3.90	2.8
Oct. 28	C. G. Cline	1,923	10	4.6	1.40	4.10	6.5

Daily Gauge Height and Discharge of Brash Creek above Intake for 1915.

(Drainage area, 10 square miles.)

Day.							October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1									4.00	4.4	....	3.1
2									....	4.4	3.90	2.8
3									....	4.4	....	2.8
4									4.00	4.4	....	2.8
5									....	4.0	....	2.8
6									....	3.6	3.90	2.8
7									....	3.2	....	3.1
8									3.90	2.8	....	3.3
9									....	2.5	3.95	3.6
10									....	2.1	....	3.4
11									3.80	1.8	....	3.2
12									....	2.0	....	3.0
13									....	2.3	3.90	2.8
14									....	2.6	....	2.8
15									3.90	2.8	....	2.8
16									....	3.3	3.90	2.8
17									....	3.9	....	2.8
18									4.00	4.4	....	2.8
19									....	4.0	....	2.8
20									....	3.6	3.90	2.8
21									....	3.2	....	2.8
22									3.90	2.8	....	2.8
23									....	2.8	3.90	2.8
24									....	2.8	....	2.8
25									3.90	2.8	....	2.8
26									....	3.0	....	2.8
27							....	....		3.2	3.90	2.8
28							4.10	6.5	....	3.4	....	2.5
29							....	....	3.95	3.6	....	2.3
30										3.3	....	2.0
31							....	....		....	3.80	1.8

Monthly Discharge of Brash Creek above Waterworks Intake for 1915.

(Drainage area, 10 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
November	4.4	1.8	3.2	0.32	0.36	190
December	3.6	1.8	2.8	0.28	0.32	170
The period	4.4	1.8	3.0	0.30	0.68	360

CHASE CREEK.—(2073).

Location.—Section 25, township 21, range 13, west of the 6th meridian; Water District No. 2.

Records Available.—June 1 to November 9, 1911; March 1 to December 7, 1912; May 9 to September 30, 1915.

Drainage Area.—One hundred and twenty square miles.

Gauge.—Vertical staff read daily by Geo. Keilty.

Channel.—There were some obstructions in the channel which interfered with a free flow of the stream, particularly at high water. These were removed on June 5, causing a change in the rating. Conditions have been stable ever since.

Discharge Measurements.—Three measurements were obtained to define the rating curve for high stages previous to June 5, and five measurements for the lower stages occurring after the change.

Winter Flow.— Ice conditions obtain during the three winter months.

Accuracy.—The results obtained before June 5 are subject to some uncertainty; after that date, they should be quite reliable except for discharges above 100 cubic feet per second.

Discharge Measurements of Chase Creek near Chase.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft
1915							
May 5	K. G. Chisholm	1,915	31	66	2.08	1.89	136
May 19	F. R. Archibald	1,673	53	160	1.58	3.08	253
June 2	E. M. Dann	1,055	20	70	1.40	1.30	97
June 12	E. M. Dann	1,055	28	25	1.90	0.60	50
July 4	McNaughton & Tredcroft	1,915	31	37	2.40	0.92	88
July 15	Archibald & Mason	1,055	33	44	1.96	1.07	86
July 26	Archibald & Mason	1,055	31	25	1.59	0.48	40
Oct. 1	A. L. McNaughton	1,915	20	9	1.32	0.00	12

NOTE.—There was a change in the creek bed on June 5, with a corresponding change in the rating curve.

Daily Gauge Height and Discharge of Chase Creek near Chase for 1915.

(Drainage area, 120 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	1.40	99	1.40	125	0.50	41	0.00	11
2	....	....	....	....	1.30	90	1.20	105	0.40	33	0.00	11
3	....	....	....	....	0.90	57	1.00	86	0.50	41	0.00	11
4	....	....	....	....	0.80	49	0.90	77	0.50	41	0.00	11
5	June 5	change	of gau	ge.	0.70	41	0.80	68	0.30	27	0.00	11
6	....	....	....	....	0.70	59	0.80	68	0.40	33	0.00	11
7	....	....	....	....	0.80	68	0.70	59	0.30	27	0.00	11
8	....	....	....	....	0.80	68	0.80	68	0.20	21	0.00	11
9	....	....	2.30	180	0.80	68	0.70	59	0.20	21	0.00	11
10	....	....	2.30	180	0.70	59	0.60	50	0.20	21	0.00	11
11	....	....	2.30	180	0.70	59	0.60	50	0.10	16	0.00	11
12	....	....	2.00	150	0.60	50	0.70	59	0.10	16	0.00	11
13	....	....	1.80	135	0.70	59	0.80	68	0.10	16	0.00	11
14	....	....	1.70	125	0.80	68	0.90	77	0.10	16	0.10	16
15	....	....	2.90	235	0.80	68	1.00	86	0.00	11	0.10	16
16	....	....	2.90	235	0.80	68	1.40	125	0.00	11	0.10	16
17	....	....	2.80	225	1.00	86	1.20	105	0.10	16	0.00	11
18	....	....	2.70	220	1.20	105	1.00	86	0.10	16	0.00	11
19	....	....	3.20	265	1.00	86	0.90	77	0.10	16	0.00	11
20	....	....	3.60	300	1.00	86	0.80	68	0.10	16	0.00	11
21	....	....	3.10	255	0.90	77	0.70	59	0.20	21	0.00	11
22	....	....	2.90	235	0.80	68	0.60	50	0.10	16	0.00	11
23	....	....	2.60	210	0.80	68	0.50	41	0.10	16	0.00	11
24	....	....	2.30	180	0.70	59	0.60	50	0.00	11	0.00	11
25	....	....	2.20	160	0.70	59	0.50	41	0.00	11	0.00	11
26	....	....	2.00	150	0.80	68	0.50	41	0.00	11	0.00	11
27	....	....	1.80	135	2.90	275	0.50	41	0.00	11	0.00	11
28	....	....	1.80	135	2.00	185	0.60	50	0.00	11	0.00	11
29	....	....	1.80	135	1.90	175	0.50	41	0.00	11	0.00	11
30	....	....	1.60	115	1.70	155	0.50	41	0.00	11	0.00	11
31	....	....	1.50	105	....	....	0.50	41	0.00	11	..	

Monthly Discharge of Chase Creek near Chase for 1915.

(Drainage area, 120 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	275	41	86	0.72	0.80	5,120
July	125	41	67	0.56	0.65	4,120
August	41	11	19	0.16	0.18	1,170
September	16	11	12	0.10	0.11	710
The period	275	11	46	0.38	1.74	11,120

CRAZY CREEK.—(2051).

Location.—Section 28, township 23, range 5, west of the 6th meridian.

Drainage Area.—Forty-five square miles.

Records Available.—March 8 to December 13, 1914; March 24 to December 31, 1915.

Gauge.—Standard vertical staff situated on C.P.R. siding bridge.

Channel.—The channel averages about 75 feet in width. Bed of stream is rocky, and velocities are high.

Winter Flow.—Ice conditions exist on this stream during November, December, January and February.

Discharge Measurements.—Five measurements made during 1913-14-15 agree fairly well and cover the whole range of stage.

Accuracy.—Results should be quite reliable at all stages.

Discharge Measurements of Crazy Creek near Taft.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Oct. 25	Dann & Chisholm	1,055	46	57.8	2.05	1.60	118
1914							
Mar. 3	K. G. Chisholm	1,505	33	21.8	1.11	0.72	24
May 18	E. H. Tredcroft	1,055	33	124.7	3.00	2.30	371
July 15	E. H. Tredcroft	1,923	78	151.2	4.09	2.80	620
1915							
July 20	C. H. Mason	1,055	69	85.5	3.15	2.00	270

Daily Gauge Height and Discharge of Crazy Creek near Taft for 1915.

(Drainage area, 45 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	1.35	74	1.90	205	2.10	280
2	......	......	......	......	......	......	1.75	160	2.00	240	2.15	300
3	......	......	......	......	......	......	2.40	415	2.10	280	2.10	280
4	......	......	......	......	......	......	2.20	325	2.10	280	2.15	300
5	......	......	......	......	......	......	2.10	280	2.20	325	2.20	325
6	......	......	......	......	......	......	1.90	205	2.25	350	2.05	260
7	......	......	......	......	......	......	1.90	205	2.40	420	2.50	470
8	......	......	......	......	......	......	1.90	205	2.60	520	2.20	325
9	......	......	......	......	......	......	1.75	160	2.60	520	2.15	300
10	......	......	......	......	......	......	1.70	145	2.80	620	2.00	240
11	......	......	......	......	......	......	1.75	160	2.40	420	1.90	205
12	......	......	......	......	......	......	1.80	175	2.20	325	1.90	205
13	......	......	......	......	......	......	2.00	240	2.20	325	1.90	205
14	......	......	......	......	......	......	1.90	205	2.25	350	1.95	220
15	......	......	......	......	......	......	1.85	190	2.20	325	2.05	260
16	......	......	......	......	......	......	1.90	205	2.10	280	2.00	240
17	......	......	......	......	......	......	2.10	280	2.10	280	2.60	520
18	......	......	......	......	......	......	2.15	300	2.20	325	2.25	350
19	......	......	......	......	......	......	2.20	325	2.40	420	2.10	280
20	......	......	......	......	......	......	2.25	350	2.60	520	2.15	300
21	......	......	......	......	......	......	2.20	325	2.50	470	2.10	280
22	......	......	......	......	......	......	2.10	280	2.70	570	2.05	260
23	......	......	......	......	......	......	2.10	280	2.50	470	2.00	240
24	......	......	......	......	1.50	98	2.05	260	2.45	440	2.00	240
25	......	......	......	......	1.45	90	1.80	175	2.40	420	1.95	220
26	......	......	......	......	1.35	74	1.90	205	2.30	370	2.50	470
27	......	......	......	......	1.30	67	1.80	175	2.20	325	2.50	470
28	......	......	......	......	1.20	53	1.75	160	2.65	540	2.40	420
29	......	......	......	......	1.20	53	1.95	225	2.45	440	2.35	395
30	......	......	......	......	1.30	67	1.90	205	2.20	325	2.20	325
31	......	......		......	1.30	67	......	......	2.10	280	......	......

Day.	July.		August.		September.		October.		November.		December.	
1	2.10	280	1.40	82	0.95	32	1.10	43	1.55	110	0.90	29
2	2.00	240	1.40	82	0.90	29	1.15	48	1.50	98	0.85	27
3	1.90	205	1.90	205	0.90	29	1.20	53	1.45	90	0.80	26
4	1.90	205	1.50	100	0.90	29	1.20	53	1.40	82	1.00	35
5	1.85	190	1.40	82	0.85	27	1.30	67	1.45	90	1.00	35
6	1.80	175	1.40	82	0.85	27	1.30	67	1.40	82	0.95	32
7	1.95	225	1.35	74	0.85	27	1.25	60	1.40	82	0.90	29
8	1.80	175	1.30	67	0.85	27	1.20	53	1.35	74	0.90	29
9	2.10	280	1.25	60	0.85	27	1.10	43	1.30	67	1.05	39
10	1.95	225	1.20	53	0.85	27	1.05	39	1.20	53	1.00	35
11	2.25	350	1.20	53	0.85	27	1.00	35	1.20	53	0.95	32
12	2.20	325	1.15	48	0.85	27	1.00	35	1.15	48	0.90	29
13	2.30	370	1.10	43	0.85	27	1.00	35	1.10	43	0.90	29
14	2.20	325	1.10	43	1.00	35	1.40	82	1.00	35	0.90	29
15	2.60	515	1.10	43	1.30	67	1.15	48	1.00	35	0.90	29
16	2.65	540	1.20	53	1.60	120	1.10	43	1.00	35	0.90	29
17	2.40	415	1.25	60	1.30	67	1.10	43	1.10	43	0.85	27
18	2 30	370	1.30	67	1.20	53	1.25	60	1.10	43	0.85	27
19	2.15	305	1.20	58	1.40	82	1.50	98	1.10	43	0.85	27
20	2.00	240	1.10	43	1.20	53	1.40	82	1.05	39	0.85	27
21	1.90	205	1.05	39	1.20	53	1.55	110	1.00	35	0.90	29
22	1.85	190	1.00	35	1.10	43	1.50	98	1.00	35	0.80	26
23	1.80	175	1.00	35	1.10	43	1.50	98	1.00	35	0.80	26
24	1.70	145	1.00	35	1.00	35	1.70	145	1.00	35	0.80	26
25	1.60	120	0.95	32	0.95	32	1.70	145	1.00	35	0.80	26
26	1.55	110	0.95	32	0.95	32	1.65	130	1.00	35	0.80	26
27	1.55	110	0.95	32	0.95	32	1.75	160	1.00	35	0.75	25
28	1.55	110	0.95	32	0.95	32	1.70	145	0.95	32	0.75	25
29	1.55	110	0.95	32	0.95	32	1.60	120	0.90	29	0.75	25
30	1.50	100	0.95	32	0.95	32	1.60	120	0.90	29	0.70	25
31	1.45	90	0.95	32		...	1 60	120		......	0 70	25

Monthly Discharge of Crazy Creek near Taft for 1915.

(Drainage area, 45 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	415	74	230	5.10	5.69	13,700
May	620	205	386	8.58	9.89	23,700
June	520	205	306	6.80	7.59	18,200
July	540	90	239	5.31	6.12	14,700
August	205	32	57	1.27	1.46	3,500
September	120	27	40	0.89	0.99	2,380
October	160	35	80	1.78	2.05	4,920
November	110	29	53	1.18	1.32	3,150
December	39	25	29	0.64	0.74	1,780
The period	620	25	158	3.51	35.85	86,030

EAGLE RIVER AT MALAKWA.—(2010).

Location.—Section 9, township 23, range 6, west 6th meridian.

Records Available.—May 14 to December 31, 1913; January 8 to December 12, 1914; February 7 to December 31, 1915.

Drainage Area.—Four hundred and twenty square miles.

Gauge.—Standard chain gauge situated on highway bridge and read daily by P. C. Cold.

Channel.—The channel is uniform and straight for 100 yards above and below the gauge.

Discharge Measurements.—Are made from upstream side of highway bridge. Velocities are uniform and not too high. Measurements made during 1913-14-15 agree very well and cover the whole range of stage.

Winter Flow.—Partial ice conditions exist on the river during January and February.

Accuracy.—The results are considered to be very reliable at all stages.

Discharge Measurements of Eagle River at Malakwa.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
May 14	Richardson & Elliott	1,048	125	674	4.00	4.80	2,690
May 31	J. A. Elliott	1,672	132	1,100	6.46	6.80	7,110
June 7	J. A. Elliott	1,672	132	1,090	6.20	6.70	6,750
July 10	J. A. Elliott	1,672	128	740	4.11	5.12	3,060
Aug. 27	J. A. Elliott	1,672	128	580	2.49	3.70	1,440
Nov. 7	Dann & Chisholm	1,505	110	454	1.36	2.61	620
1914							
Mar. 3	K. G. Chisholm	1,505	125	206	1.24	1.80	257
May 18	E. H. Tredcroft	1,055	111	718	3.98	4.90	2,860
July 16	E. H. Tredcroft	1,923	120	719	4.14	5.05	2,972
1915							
July 20	Archibald & Mason	1,055	130	667	3.10	4.50	2,085

Daily Gauge Height and Discharge of Eagle River at Malakwa for 1915.

(Drainage area, 420 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		.....	...	......	1.50	170	2.70	660	4.10	1,750	4.50	2,190
2					1.50	170	3.10	910	4.25	1,900	4.50	2,190
3		.		...	1.50	170	3.90	1,550	4.40	2,060	4.45	2,120
4					1.50	170	4.50	2,190	4.40	2,060	4.55	2,250
5			...	....	1.50	170	4.30	1,950	4.55	2,250	4.50	2,190
6			....	....	1.55	185	4.00	1,650	4.85	2,680	4.50	2,190
7			1.60	200	1.55	185	4.00	1,650	5.15	3,170	4.20	1,850
8			1.55	185	1.55	185	3.95	1,600	5.50	3,830	4.80	2,600
9			1.50	170	1.55	185	3.85	1,500	5.65	4,130	4.45	2,120
10			1.60	200	1.60	200	3.60	1,280	5.75	4,330	4.15	1,800
11			1.55	185	1.60	200	3.60	1,280	5.15	3,170	4.00	1,650
12			1.50	170	1.60	200	3.90	1,550	4.60	2,320	4.00	1,650
13			1.40	140	1.65	210	4.20	1,850	4.65	2,380	4.15	1,800
14			1.50	170	1.70	225	4.00	1,650	4.80	2,600	4.40	2,060
15			1.50	170	2.20	400	4.00	1,650	4.85	2,680	5.40	3,620
16			1.50	170	2.30	445	4.15	1,800	4.50	2,190	4.80	2,600
17			1.50	170	2.20	400	4.55	2,250	4.40	2,060	5.30	3,440
18			1.55	185	2.30	445	4.75	2,520	4.70	2,450	4.85	2,670
19			1.50	170	2.35	470	4.85	2,680	3.30	4,440	4.50	2,190
20		.	1.50	170	2.40	495	4.80	2,600	5.45	3,740	4.70	2,450
21			1.50	170	2.50	550	4.40	2,060	5.40	3,620	4.50	2,190
22		.	1.45	155	2.75	690	4.05	1,700	5.40	3,620	4.40	2,060
23		.	1.50	170	3.05	880	3.95	1,600	5.10	3,090	4.40	2,060
24		.	1.50	170	3.00	850	3.95	1,600	4.90	2,750	4.55	2,250
25		.	1.55	185	2.85	760	3.80	1,450	5.15	3,170	4.50	2,190
26		.	1.50	170	2.70	660	3.90	1,550	4.85	2,680	5.40	3,620
27			1.55	185	2.55	575	3.80	1,450	4.50	2,190	5.10	3,090
28			1.50	170	2.60	605	3.60	1,280	5.30	3,440	4.90	2,750
29			......	.	2.50	550	4.45	2,120	5.00	2,920	4.85	2,670
30			.	....	2.60	605	4.40	2,060	4.60	2,320	4.70	2,450
31		......	......	....	2.70	660	....	....	4.35	2,000	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	4.60	2,320	3.80	1,450	2.70	660	2.55	580	3.15	950	2.10	355
2	4.50	2,190	3.75	1,400	2.60	605	2.60	600	3.00	850	2.10	355
3	4.35	2,000	4.35	2,000	2.70	660	2.55	580	2.90	780	2.10	355
4	4.40	2,060	3.90	1,550	2.55	575	2.45	525	3.00	850	2.15	375
5	4.45	2,125	3.70	1,360	2.55	575	2.50	550	2.70	660	2.15	375
6	4.20	1,850	3.60	1,280	2.50	550	2.55	580	2.70	660	2.15	375
7	4.35	2,000	3.65	1,320	2.35	470	2.35	470	2.70	660	2.10	355
8	4.35	2,000	3.60	1,280	2.40	495	2.30	440	2.65	630	2.15	375
9	4.75	2,520	3.60	1,280	2.30	445	2.20	400	2.60	600	2.20	400
10	4.35	2,000	3.60	1,280	2.25	420	2.15	375	2.55	580	2.20	400
11	5.00	2,920	3.55	1,240	2.25	420	2.10	355	2.50	550	2.20	400
12	4.80	2,600	3.45	1,160	2.15	375	2.10	355	2.35	470	2.15	375
13	4.90	2,750	3.45	1,160	2.10	355	2.20	400	2.40	500	2.10	355
14	4.95	2,830	3.40	1,120	2.10	355	2.70	660	2.40	500	2.10	355
15	5.60	4,020	3.40	1,120	2.85	750	2.50	550	2.35	470	2.05	340
16	5.45	3,740	3.35	1,080	2.85	750	2.40	500	2.35	470	2.05	340
17	5.00	2,920	3.75	1,400	2.90	780	2.45	525	2.30	440	2.05	340
18	4.90	2,750	3.55	1,240	2.65	630	2.50	550	2.30	440	2.05	340
19	4.70	2,450	3.25	1,010	2.95	815	2.75	700	2.30	440	2.05	340
20	4.50	2,190	3.40	1,120	2.60	605	2.80	725	2.25	420	2.05	340
21	4.40	2,060	3.40	1,120	2.50	550	3.10	910	2.25	420	2.10	355
22	4.30	1,950	3.35	1,080	2.55	575	3.10	910	2.30	440	2.10	355
23	4.15	1,800	3.30	1,050	2.40	495	3.00	850	2.30	440	2.10	355
24	4.00	1,650	3.20	980	2.30	445	3.25	1,020	2.25	420	2.10	355
25	3.90	1,550	3.25	1,010	2.30	445	3.20	980	2.25	420	2.10	355
26	3.90	1,550	3.20	980	2.35	470	3.30	1,050	2.25	420	2.05	340
27	3.85	1,500	3.00	850	2.25	420	3.55	1,240	2.15	375	2.00	320
28	3.90	1,550	3.00	850	2.20	400	3.50	1,200	2.10	355	2.00	320
29	3.85	1,500	2.90	780	2.20	400	3.30	1,050	2.15	375	1.80	255
30	3.80	1,450	3.20	980	2.20	400	3.20	980	2.20	400	1.60	200
31	3.70	1,360	3.00	850	......		3.20	980	.....	....	2.00	320

Monthly Discharge of Eagle River at Malakwa for 1915.

(Drainage area, 420 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	880	170	409	0.97	1.12	25,100
April	2,680	660	1,721	4.10	4.57	102,400
May	4,330	1,750	2,806	6.71	7.74	172,500
June	3,670	1,650	2,365	5.63	6.28	141,000
July	4,020	1,360	2,200	5.23	6.03	135,300
August	2,000	780	1,174	2.79	3.22	72,200
September	815	355	530	1.26	1.41	31,500
October	1,240	355	696	1.66	1.91	42,800
November	950	355	533	1.27	1.42	31,700
December	400	200	348	0.83	0.96	21,400
The period	4,330	170	1,278	3.04	34.66	775,900

GRANITE CREEK.—(2064).

Location.—Near Coalmont; Water District No. 4.

Records Available.—June 19 to December 31, 1914; April 1 to September 30, 1915.

Drainage Area.—Forty square miles.

Gauge.—Standard vertical staff gauge graduated in feet and tenths, situated on footbridge. Read daily by Miss Emily Cook.

Channel.—Channel is straight for 100 feet above and 500 feet below measuring section. Velocity high. Bed of stream is composed of gravel and rock, considered permanent.

Discharge Measurements.—Six measurements made during 1914 and 1915 agree very well and cover practically all stages.

Accuracy.—Results should be quite reliable at all stages.

Discharge Measurements of Granite Creek near Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
June 18	K. G. Chisholm	1,913	80	92	3.26	2.22	300
July 25	K. G. Chisholm	1,913	27	44	0.70	1.32	31
Sept. 3	K. G. Chisholm	1,913	26	20	0.61	1.05	12
Nov. 26	K. G. Chisholm	1,673	37	36	0.86	1.40	31
1915							
April 9	K. G. Chisholm	1,915	31	53	1.09	1.59	58
June 3	E. H. Tredcroft	1,923	80	57	2.00	1.75	107

Daily Gauge Height and Discharge of Granite Creek at Mouth for 1915.

(Drainage area, 40 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.30	25	1.90	160	1.87	150	1.30	25	1.22	19.0	0.97	10.7
2	1.50	49	1.90	160	1.80	125	1.27	23	1.20	18.0	1.00	11.0
3	1.55	58	1.97	185	1.80	125	1.27	23	1.15	15.7	1.00	11.0
4	1.70	92	2.00	200	1.77	115	1.30	25	1.10	13.0	0.97	10.7
5	1.65	79	2.12	250	1.72	100	1.22	19	1.10	13.0	0.95	10.5
6	1.60	67	2.22	300	1.70	92	1.20	18	1.07	12.7	0.95	10.5
7	1.65	79	2.30	335	1.70	92	1.22	19	1.05	12.2	0.95	10.5
8	1.65	79	2.27	320	1.67	85	1.20	18	1.05	12.2	0.95	10.5
9	1.60	67	2.25	310	1.67	85	1.20	18	1.05	12.2	1.00	11.0
10	1.60	67	2.17	275	1.67	85	1.20	18	1.02	11.5	1.10	13.5
11	1.65	79	2.10	240	1.75	110	1.20	18	1.00	11.0	1.12	14.4
12	1.75	110	2.00	200	1.65	80	1.17	16	1.00	11.0	1.10	13.5
13	1.85	140	2.07	225	1.60	67	1.25	21	1.00	11.0	1.02	11.5
14	1.75	110	2.20	290	1.60	67	1.52	52	1.00	11.0	1.07	12.7
15	1.80	125	2.07	225	1.60	67	1.50	49	1.00	11.0	1.05	12.2
16	1.90	160	2.00	200	1.55	55	1.42	38	1.00	11.0	1.02	11.5
17	2.05	220	2.02	205	1.57	60	1.32	27	1.02	11.5	1.00	11.0
18	2.15	265	2.20	290	1.57	60	1.30	25	1.00	11.0	1.00	11.0
19	2.17	275	2.27	320	1.50	49	1.25	21	1.00	11.0	1.00	11.0
20	2 15	265	2.20	290	1.50	49	1.20	18	1.06	12.2	1.00	11.0
21	2.00	200	2.15	265	1.47	45	1.17	16	1.05	12.2	1.00	11.0
22	1.92	165	2.07	225	1.42	38	1.12	14	1.00	11.0	1.00	11.0
23	1.90	160	2.02	205	1.40	35	1.10	13	1.00	11.0	1.02	11.5
24	1.92	165	2.15	265	1.45	42	1.10	13	0.97	10.7	1.27	23.0
25	1.95	180	2.07	225	1.40	35	1.12	14	0.95	10.5	1.17	16.0
26	2.00	200	2.00	200	1.40	35	1.20	18	0.95	10.5	1.10	13.0
27	2.00	200	2.00	200	1.42	38	1.37	32	0.95	10.5	1.00	11.0
28	2.00	200	2.00	200	1.40	35	1.32	25	0.95	10.5	1.00	11.0
29	2.12	250	1.92	165	1.40	35	1.37	32	0.95	10.5	1.00	11.0
30	2.00	200	1.90	160	1.35	30	1.30	25	0.95	10.5	1.00	11 0
31	....	....	1.85	140	....	....	1.30	25	0.95	10.5	....	....

Monthly Discharge of Granite Creek at Mouth for 1915.

(Drainage area, 40 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	275	25	144	3.60	4.02	8,570
May	335	140	233	5.82	6.71	14,330
June	150	30	70	1.75	1.95	4,165
July	52	13	23	0.57	0.66	1,414
August	19	10	12	0.30	0.35	732
September	23	10	12	0.30	0.33	714
The period	335	10	82	2.05	14.02	29,925

KETTLE RIVER, NORTH FORK.—(2052).

Location.—At Grand Forks; Water District No. 5.

Records Available.—June 1 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—Six hundred and forty square miles.

Gauge.—Standard vertical staff gauge situated on footbridge, graduated in feet and tenths, and read daily by Geo. O'Keefe.

Channel.—Channel is straight for 100 yards above and below measuring section. Velocity high.

Discharge Measurements.—Six discharge measurements made during 1914 and 1915 cover all stages up to 5,000 cubic feet per second.

Accuracy.—During the early spring a pile of slag interfered somewhat with the accuracy of the results, but a correction was made to allow for this condition.

Discharge Measurements of North Fork of Kettle River at Grand Forks.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 19	C. E. Richardson	1,527	132	1,100	4.59	5.08	5,050
June 9	K. G. Chisholm	1,913	132	847	2.77	4.00	2,348
July 22	K. G. Chisholm	1,913	132	474	0.90	1.48	426
Aug. 22	K. G. Chisholm	1,913	79	255	0.35	0.52	88
Aug. 24	K. G. Chisholm	1,913	110	244	0.35	0.50	86
1915							
Mar. 19	K. G. Chisholm	1,915	132	152	2.51	2.48	382[1]
June 10	E. H. Tredcroft	1.923	133	733	2.80	3.73	2,040

[1] Affected by backwater from slag.

Daily Gauge Height and Discharge of North Fork of Kettle River at Grand Forks for 1915.

(Drainage area, 640 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.00	220	0.90	180	1.20	300	5.1	5,100	4.70	3,800	5.30	5,880
2	1.00	220	0.90	180	1.20	300	4.9	4,420	4.40	3,050	5.15	5,290
3	1.00	220	1.00	220	1.30	340	4.5	3,270	4.15	2,570	4.70	3,800
4	1.00	220	1.00	220	1.30	340	4.25	2,750	4.00	2,350	4.40	3,050
5	1.00	220	1.00	220	1.30	340	4.20	2,650	4.15	2,570	4.40	3,050
6	1.00	220	1.00	220	1.30	340	4.20	2,650	4.60	3,520	4.30	2,850
7	1.00	220	1.00	220	1.30	340	4.20	2,650	4.90	4,420	4.20	2,650
8	1.00	220	1.10	260	0.80	150	4.10	2,490	4.80	4,100	4.10	2,490
9	1.00	220	1.10	260	1.30	340	4.00	2,350	4.80	4,100	4.00	2,350
10	1.00	220	1.10	260	1.40	385	4.00	2,350	4.80	4,100	4.00	2,350
11	1.00	220	1.10	260	1.40	385	4.10	2,490	4.90	4,420	3.75	2,030
12	0.90	180	1.10	260	1.50	435	4.20	2,650	5.00	4,750	3.55	1,830
13	0.90	180	1.10	260	1.50	435	4.30	2,850	5.15	5,290	3.40	1,680
14	0.80	150	1.10	260	1.50	435	4.40	3,050	5.30	5,880	3.30	1,590
15	0.80	150	1.10	260	1.50	435	4.50	3,270	5.40	6,300	3.20	1,510
16	0.90	120	1.10	260	1.50	435	4.35	3,520	5.40	6,300	3.10	1,430
17	0.70	120	1.10	260	1.50	435	4.85	4,260	5.55	6,940	3.10	1,430
18	0.70	120	1.10	260	1.50	435	5.35	6,090	5.55	6,940	3.00	1,350
19	0.80	150	1.10	260	1.50	435	5.75	7,790	5.65	7,360	3.00	1,350
20	0.80	150	1.10	260	1.50	435	5.60	7,150	5.80	8,000	3.00	1,350
21	0.80	150	1.10	260	2.00	690	5.00	4,750	5.70	7,570	3.00	1,350
22	0.80	150	1.10	260	3.00	1,350	4.70	3,800	5.60	7,150	2.90	1,270
23	0.80	150	1.20	300	3.20	1,510	4.30	2,850	5.50	6,720	2.80	1,200
24	0.80	150	1.20	300	3.40	1,680	4.15	2,570	5.40	6,300	2.80	1,200
25	0.80	150	1.20	300	3.40	1,680	4.05	2,420	5.20	5,480	2.70	1,130
26	0.80	150	1.20	300	3.20	1,510	4.00	2,350	5.20	5,480	2.60	1,060
27	0.80	150	1.20	300	3.00	1,350	4.00	2,350	5.20	5,480	2.70	1,130
28	0.80	150	1.20	300	3.00	1,350	4.00	2,350	6.10	9,350	2.80	1,200
29	0.80	150	....	....	3.30	1,600	4.20	2,650	6.15	9,570	2.80	1,200
30	0.80	150	....	....	3.55	1,830	4.90	4,420	5.90	8,450	2.80	1,200
31	0.80	150	....	....	3.90	2,200	....	....	5.65	7,360	....	....

	July.		August.		September.		October.		November.		December.	
1	2.60	1,060	2.30	870	0.70	120	0.50	85	0.60	100	0.60	100
2	2.50	990	2.30	870	0.60	100	0.50	85	0.65	110	0.60	100
3	2.50	990	2.20	810	0.60	100	0.50	85	0.65	110	0.60	100
4	2.60	1,060	2.10	750	0.60	100	0.50	85	0.70	120	0.60	100
5	2.50	990	2.10	750	0.60	100	0.35	60	0.70	120	0.60	100
6	2.50	990	2.00	690	0.60	100	0.35	60	0.70	120	0.60	100
7	2.65	1,090	1.90	640	0.50	85	0.35	60	0.70	120	0.65	110
8	2.85	1,240	1.80	580	0.50	85	0.50	85	0.70	120	0.65	110
9	3.05	1,390	1.80	580	0.50	85	0.50	85	0.70	120	0.65	110
10	3.10	1,430	1.70	530	0.50	85	0.50	85	0.70	120	0.65	110
11	3.00	1,350	1.60	480	0.50	85	0.50	85	0.70	120	0.65	110
12	2.90	1,270	1.50	430	0.55	90	0.55	90	0.70	120	0.65	110
13	2.80	1,200	1.50	430	0.55	90	0.55	90	0.70	120	0.65	110
14	2.90	1,270	1.40	380	0.50	85	0.60	100	0.70	120	0.65	110
15	3.00	1,350	1.40	380	0.50	85	0.60	100	0.70	120	0.65	110
16	3.10	1,430	1.40	380	0.50	85	0.60	100	0.70	120	0.65	110
17	3.10	1,430	1.30	340	0.50	85	0.60	100	0.70	120	0.65	110
18	3.00	1,350	1.30	340	0.50	85	0.55	90	0.70	120	0.65	110
19	3.00	1,350	1.30	340	0.50	85	0.55	90	0.70	120	0.65	110
20	2.90	1,270	1.20	300	0.50	85	0.55	90	0.70	120	0.60	100
21	2.80	1,200	1.20	300	0.50	85	0.55	90	0.65	110	0.60	100
22	2.65	1,090	1.20	300	0.50	85	0.55	90	0.65	110	0.60	100
23	2.50	990	1.10	260	0.50	85	0.55	90	0.65	110	0.60	100
24	2.40	930	1.10	260	0.50	85	0.55	90	0.65	110	0.60	100
25	2.40	930	1.00	220	0.50	85	0.55	90	0.65	110	0.60	100
26	2.40	930	1.00	220	0.50	85	0.55	90	0.65	110	0.60	100
27	2.30	870	0.90	180	0.50	85	0.55	90	0.65	110	0.60	100
28	2.30	870	0.90	180	0.50	85	0.55	90	0.60	100	0.60	100
29	2.30	870	0.80	150	0.50	85	0.55	90	0.60	100	0.60	100
30	2.40	930	0.80	150	0.50	85	0.55	90	0.60	100	0.60	100
31	2.40	930	0.70	120	....	....	0.60	100	....	....	0.60	100

Monthly Discharge of North Fork of Kettle River at Grand Forks for 1915.

(Drainage area, 640 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	220	120	174	0.27	0.31	10,700
February	300	180	256	0.40	0.42	14,200
March	2,200	150	781	1.22	1.41	48,000
April	7,790	2,350	3,477	5.43	6.06	207,000
May	9,570	2,350	5,666	8.85	10.20	348,000
June	5,880	1,060	2,042	3.18	3.55	121,500
July	1,430	870	1,130	1.76	2.03	69,500
August	870	120	426	0.66	0.76	26,200
September	120	85	89	0.14	0.16	5,300
October	100	60	87	0.14	0.16	5,400
November	120	100	114	0.18	0.20	6,800
December	110	100	104	0.16	0.19	6,400
The year	9,570	60	1,195	1.87	25.45	869,000

KETTLE RIVER, WEST FORK.—(2045).

Location.—Near Westbridge; Water District No. 5.

Records Available.—February 23 to September 30, 1914; January 1 to February 6 and March 29 to December 31, 1915.

Drainage Area.—Six hundred and ninety square miles.

Gauge.—Standard vertical staff gauge, graduated in feet and tenths, read daily by R. Demazes.

Channel.—Channel is straight for 500 feet above and below measuring section. Bed composed of gravel and boulders.

Discharge Measurements.—Five measurements made during 1914 and 1915 agree very well and cover all stages to a discharge of 1,300 cubic feet per second.

Winter Flow.—Partial ice conditions prevailed during February and March.

Discharge Measurements of Kettle River, West Fork, at Westbridge.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
June 7	Dann & Chisholm	1,913	97	304	4.05	2.78	1,235
July 20	K. G. Chisholm	1,913	97	122	1.43	0.91	174
Aug. 27	K. G. Chisholm	1,913	41	35	1.23	0.29	42
1915							
Mar. 24	K. G. Chisholm	1,915	97	135	1.21	1.00	164
June 8	E. H. Tredcroft	1,923	97	280	3.50	2.50	982

Note.—All measurements are referred to the gauge in use during 1915.

Daily Gauge Height and Discharge of Kettle River at Westbridge for 1915.

(Drainage area, 690 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.1	230	1.05	215	....	....	1.30	290	2.65	1,110	3.50	2,020
2	0.9	170	0.95	185	....	....	1.50	360	2.70	1,160	3.25	1,750
3	0.85	155	0.95	185	....	....	1.85	520	2.70	1,160	3.05	1,530
4	0.85	155	0.90	170	....	....	2.00	610	2.65	1,110	2.90	1,370
5	0.90	170	0.90	170	....	....	2.10	670	2.65	1,110	2.75	1,210
6	0.90	170	0.90	170	....	....	2.10	670	2.67	1,130	2.70	1,160
7	0.90	170	Stream	....	....	....	2.20	740	2.90	1,370	2.65	1,110
8	0.90	170	Frozen	....	....	....	2.20	740	3.05	1,530	2.55	1,020
9	0.90	170	....	....	....	....	2.15	705	3.05	1,530	2.40	890
10	0.85	155	....	....	....	....	2.10	670	3.20	1,690	2.30	810
11	1.00	200	....	....	....	....	2.10	670	3.10	1,590	2.30	810
12	1.00	200	....	....	....	....	2.35	850	2.75	1,210	2.20	740
13	1.00	200	....	....	....	....	2.50	975	2.60	1,060	2.25	775
14	0.90	170	....	....	....	....	2.50	975	3.05	1,530	2.20	740
15	0.90	170	....	....	....	....	2.45	930	3.35	1,850	2.15	705
16	0.90	170	....	....	....	....	2.55	1,020	3.05	1,530	2.05	640
17	1.00	200	....	....	....	....	2.72	1,180	2.90	1,370	1.90	550
18	1.00	200	....	....	....	....	2.90	1,370	3.35	1,850	1.90	550
19	0.95	185	....	....	....	....	3.05	1,540	4.10	2,660	1.95	580
20	0.90	170	....	....	....	....	3.15	1,640	4.30	2,880	1.95	580
21	0.90	170	....	....	....	....	2.90	1,370	4.00	2,560	1.90	550
22	0.90	170	....	....	....	....	2.60	1,060	4.15	2,710	1.80	495
23	0.95	185	....	....	....	....	2.45	930	4.05	2,610	1.75	470
24	1.00	200	....	....	....	165	2.40	890	3.80	2,340	1.60	400
25	0.95	185	....	....	....	....	2.30	810	3.90	2,440	1.65	420
26	0.75	130	....	....	....	....	2.30	810	3.85	2,390	1.65	420
27	0.75	130	....	....	....	....	2.30	810	3.70	2,230	2.50	975
28	0.85	155	....	....	....	....	2.30	810	4.05	2,610	2.40	890
29	0.90	170	....	....	0.90	170	2.55	1,020	4.20	2,770	2.35	850
30	0.90	170	....	....	1.05	215	3.00	1,480	3.70	2,230	2.15	705
31	0.90	170	....	....	1.20	260	....	....	3.45	1,960	....	....

	July.		August.		September.		October.		November.		December.	
1	1.95	580	1.90	550	0.62	105	0.50	80	0.80	145	1.20	260
2	1.75	470	1.90	550	0.60	100	0.50	80	0.80	145	1.10	230
3	1.70	445	1.80	495	0.60	100	0.50	80	0.77	135	1.00	200
4	1.75	470	1.75	470	0.57	94	0.50	80	0.75	130	0.85	155
5	1.70	445	1.65	420	0.55	90	0.50	80	0.75	130	0.65	110
6	1.70	445	1.60	400	0.55	90	0.50	80	0.70	120	0.60	100
7	1.70	445	1.45	340	0.55	90	0.50	80	0.70	120	0.60	100
8	1.70	445	1.40	325	0.52	84	0.50	80	0.70	120	0.60	100
9	1.95	580	1.25	275	0.50	80	0.50	80	0.60	100	0.60	100
10	2.05	640	1.20	260	0.57	94	0.50	80	0.60	100	0.65	110
11	1.85	520	1.20	260	0.60	100	0.50	80	0.55	90	0.80	145
12	1.70	445	1.15	245	0.60	100	0.55	90	0.60	100	0.80	145
13	1.85	520	1.10	230	0.65	110	0.55	90	1.05	215	0.85	155
14	2.00	610	1.05	215	0.65	110	0.60	100	1.10	230	1.00	200
15	2.05	640	1.00	200	0.65	110	0.60	100	0.70	120	1.05	215
16	2.50	975	1.00	200	0.70	120	0.60	100	0.50	80	1.10	230
17	2.40	890	1.00	200	0.65	110	0.60	100	0.80	145	1.20	260
18	2.30	810	1.00	200	0.60	100	0.60	100	0.80	145	1.10	230
19	2.15	705	1.00	200	0.60	100	0.60	100	0.60	100	1.10	230
20	1.95	580	0.92	175	0.60	100	0.60	100	0.65	110	1.10	230
21	1.85	580	0.90	170	0.57	94	0.65	110	0.80	145	1.10	230
22	1.75	470	0.87	160	0.55	90	0.70	120	0.75	130	1.00	200
23	1.70	445	0.82	150	0.55	90	0.75	130	0.70	120	0.90	170
24	1.55	380	0.80	145	0.55	90	0.80	145	0.70	120	0.85	155
25	1.50	360	0.77	135	0.50	80	0.80	145	0.85	155	0.90	170
26	1.45	340	0.75	130	0.50	80	0.80	145	1.00	200	0.90	170
27	1.85	520	0.70	120	0.50	80	0.80	145	1.15	245	0.90	170
28	2.15	705	0.67	115	0.50	80	0.90	170	1.05	215	0.90	170
29	2.10	670	0.65	110	0.50	80	0.95	185	1.25	275	0.90	170
30	2.00	610	0.65	110	0.50	80	0.85	155	1.20	260	0.90	170
31	2.00	610	0.65	110	....	....	0.80	145	....	....	0.90	170

Monthly Discharge of Kettle River at Westbridge for 1915.

(Drainage area, 690 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	230	130	175	0.25	0.29	10,760
February	....	....	....	....	....	....
March	....	....	....	....	....	....
April	1,640	290	904	1.30	1.45	53,800
May	2,880	1,060	1,848	2.67	3.08	114,000
June	2,020	400	857	1.24	1.38	51,000
July	975	340	560	0.81	0.93	34,400
August	550	110	247	0.36	0.41	15,200
September	120	80	94	0.14	0.15	5,590
October	185	80	108	0.16	0.18	6,640
November	275	80	148	0.21	0.24	8,800
December	260	100	176	0.25	0.29	10,800
The period	2,880	80	512	0.74	8.40	310,990

KETTLE RIVER, NEAR NICHOLSON'S BRIDGE.—(2046).

Location.—Near Kettle Valley Water; District No. 5.

Records Available.—March 1 to December 11, 1914; February 18 to November 30, 1915.

Drainage Area.—Two thousand one hundred and eighty square miles.

Gauge.—Standard vertical staff gauge, graduated in feet and tenths, situated on pier of highway bridge, and read daily by N. Whiting, rancher.

Channel.—Average width, 150 feet; bed of stream gravel and sand, and considered permanent. Velocity high; control good.

Discharge Measurements.—Six measurements made during 1914 and 1915 agree very well and cover all ranges of stage up to 7,000 cubic feet per second.

Winter Flow.—Ice conditions exist during January, February and December.

Accuracy.—Results should be quite reliable at all stages.

Discharge Measurements of Kettle River at Nicholson's Bridge.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 20	Richardson & Varcoe	1,527	186	1,063	5.75	5.00	6,104
June 7	Dann & Chisholm	1,923	170	869	4.86	3.79	4,225
July 19	K. G. Chisholm	1,923	154	329	2.03	0.36	668
Aug. 27	K. G. Chisholm	1,913	137	184	0.78	-0.80	144
1915							
Mar. 25	K. G. Chisholm	1,915	143	301	1.50	2.05	466
June 9	E. H. Tredcroft	1,923	153	682	4.16	4.85	2,844

Daily Gauge Height and Discharge of Kettle River at Nicholson's Bridge for 1915.

(Drainage area, 2,180 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	2.00	430	2.50	720	5.70	4,040	6.30	5,000
2	......	......	......	......	2.00	430	2.70	850	5.90	4,360	6.15	4,760
3	......	......	......	......	1.85	355	3.35	1,290	5.80	4,200	5.92	4,400
4	......	......	......	......	1.70	290	4.25	2,050	5.75	4,120	5.60	3,880
5	......	......	......	......	1.60	250	4.25	2,050	5.75	4,120	5.52	3,760
6	......	......	......	......	1.55	230	4.20	2,000	5.75	4,120	5.30	3,440
7	......	......	......	......	1.50	210	4.27	2,070	6.10	4,680	5.35	3,510
8	......	......	......	......	1.48	205	4.42	2,250	6.45	5,240	5.05	3,090
9	......	......	......	......	1.43	190	4.47	2,310	6.50	5,320	4.82	2,770
10	......	......	......	......	1.40	180	4.25	2,050	6.90	5,960	4.80	2,470
11	......	......	......	......	1.40	180	4.15	1,950	6.85	5,880	4.45	2,290
12	......	......	......	......	1.38	175	4.35	2,170	6.25	4,920	4.30	2,110
13	......	......	......	......	1.35	170	4.75	2,670	5.75	4,120	4.25	2,050
14	......	......	......	......	1.40	180	5.15	3,230	5.85	4,280	4.35	2,170
15	......	......	......	......	1.45	195	5.10	3,160	6.90	5,960	4.20	2,000
16	......	......	......	......	1.50	210	5.20	3,300	6.25	4,920	4.20	2,000
17	......	......	......	......	1.50	210	5.30	3,440	5.90	4,360	3.97	1,780
18	......	......	1.83	345	1.50	210	5.90	4,360	6.35	5,080	3.85	1,680
19	......	......	1.85	355	1.53	220	6.25	4,920	7.87	7,530	3.92	1,740
20	......	......	1.95	405	1.55	230	6.50	5,320	8.20	8,080	4.15	1,950
21	......	......	2.00	430	1.55	230	6.15	4,760	7.65	7,170	4.05	1,850
22	......	......	2.05	460	1.60	250	5.90	4,360	7.80	7,420	3.75	1,600
23	......	......	2.05	460	1.65	270	5.25	3,370	7.20	6,440	3.70	1,560
24	......	......	2.00	430	1.75	310	5.10	3,160	6.75	5,720	3.70	1,480
25	......	......	2.05	460	1.90	380	5.00	3,020	7.15	6,360	3.60	1,480
26	......	......	2.12	495	1.90	380	4.87	2,840	6.85	5,880	3.75	1,600
27	......	......	2.12	495	1.85	355	4.87	2,840	6.55	5,400	5.20	3,300
28	......	......	2.10	485	2.15	510	4.85	2,810	7.05	6,200	5.05	3,090
29	......	......	......	......	2.25	570	5.30	3,440	8.00	7,750	4.85	2,810
30	......	......	......	......	2.30	600	6.35	5,080	7.00	6,120	4.60	2,470
31	......	......	......	......	2.45	690	......	......	6.55	5,400	......	......

	July.		August.		September.		October.		November.		December.	
1	4.35	2,170	3.75	1,600	1.65	270	1.37	175	2.00	430	......	......
2	4.00	1,800	3.60	1,480	1.60	250	1.35	170	2.00	430	......	......
3	3.80	1,640	3.60	1,480	1.60	250	1.32	165	1.95	405	......	......
4	3.60	1,480	3.50	1,400	1.60	250	1.37	175	1.90	380	......	......
5	3.60	1,480	3.35	1,290	1.60	250	1.47	200	1.85	355	......	......
6	3.85	1,680	3.10	1,110	1.55	230	1.50	210	1.80	330	......	......
7	3.90	1,720	3.00	1,040	1.52	215	1.50	210	1.80	330	......	......
8	4.05	1,850	2.80	910	1.50	210	1.50	210	1.82	340	......	......
9	4.15	1,950	2.60	780	1.50	210	1.45	195	1.90	380	......	......
10	4.80	2,740	2.47	710	1.50	210	1.40	180	1.90	380	......	......
11	4.30	2,110	2.45	690	1.50	210	1.40	180	1.90	380	......	......
12	4.10	1,900	2.30	600	1.50	210	1.45	195	1.87	365	......	......
13	4.10	1,900	2.30	600	1.50	210	1.50	210	1.90	380	......	......
14	4.50	2,350	2.22	560	1.55	230	1.50	210	1.92	390	......	......
15	4.35	2,170	2.20	540	1.57	235	1.52	220	1.95	405	......	......
16	5.40	3,580	2.20	540	1.60	250	1.60	250	2.00	430	......	......
17	5.30	3,440	2.17	530	1.62	255	1.60	250	2.00	430	......	......
18	5.30	3,440	2.12	500	1.65	270	1.60	250	1.95	405	......	......
19	4.95	2,950	2.15	510	1.62	255	1.60	250	1.85	355	......	......
20	4.60	2,470	2.10	480	1.60	250	1.60	250	1.80	330	......	......
21	4.45	2,290	2.05	460	1.55	230	1.60	250	1.80	230	......	......
22	4.15	1,950	2.00	430	1.50	210	1.65	270	1.87	365	......	......
23	3.90	1,720	1.97	410	1.50	210	1.65	270	1.92	390	......	......
24	3.70	1,560	1.90	380	1.50	210	1.67	280	1.90	380	......	......
25	3.55	1,440	1.82	340	1.50	210	1.85	355	1.90	380	......	......
26	3.55	1,440	1.80	330	1.50	210	1.92	390	1.92	390	......	......
27	3.65	1,520	1.75	310	1.47	200	2.05	455	2.00	430	......	......
28	3.85	1,680	1.70	290	1.40	180	2.15	515	......	380	......	......
29	3.95	1,760	1.70	290	1.40	180	2.15	515	......	380	......	......
30	3.85	1,680	1.70	290	1.40	180	2.00	430	......	380	......	......
31	3.85	1,680	1.67	280	......	......	2.00	430	......	......	......	......

Monthly Discharge of Kettle River at Nicholson's Bridge for 1915.

(Drainage area, 2,180 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	690	170	300	0.14	0.16	18,400
April	5,320	720	2,928	1.34	1.50	174,000
May	8,080	4,040	5,521	2.53	2.92	339,000
June	5,000	1,480	2,603	1.19	1.33	155,000
July	3,580	1,440	2,050	0.94	1.08	126,000
August	1,600	280	683	0.31	0.36	42,000
September	270	180	225	0.10	0.11	13,400
October	515	165	268	0.12	0.14	16,500
November	430	330	381	0.17	0.19	22,700
The period	8,080	165	1,662	0.76	7.79	907,000

KETTLE RIVER, AT CARSON.—(2049).

Location.—At Carson; Water District No. 5.

Records Available.—September 5 to December 31, 1913; January 1 to 22, February 25 to December 9, 1914; March 1 to November 30, 1915.

Drainage Area.—Three thousand and ten square miles.

Gauge.—Chain gauge on highway bridge, 4 miles from Grand Forks.

Channel.—Straight at measuring section; bed of stream, gravel and sand; control good.

Discharge Measurements.—Measurements are made from highway bridge. Six measurements made during 1914 and 1915 agree very well and cover the whole range up to 8,000 cubic feet per second.

Winter Flow.—Partial ice conditions prevail during December, January and February.

Accuracy.—Accuracy is considered good, and results should fall within 10 per cent.

Discharge Measurements of Kettle River at Carson.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 19	C. E. Richardson	1,527	169	1,460	5.37	7.45	7,840
June 9	K. G. Chisholm	1,913	166	1,160	3.62	5.65	4,200
July 23	K. G. Chisholm	1,913	158	693	0.99	2.50	684
Aug. 24	K. G. Chisholm	1,913	120	560	3.95	1.70	221
1915							
Mar. 20	K. G. Chisholm	1,915	156	615	0.52	1.96	324
June 11	E. H. Tredcroft	1,923	162	1,022	4.20	4.98	4,300

NOTE.—All measurements are referred to the new gauge, established March 20, 1915.

Daily Gauge Height and Discharge of Kettle River at Carson for 1915.

(Drainage area, 3,010 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	2.10	430	2.60	760	5.82	4,480	6.70	6,190
2	....	....	....	....	2.10	430	2.72	850	5.60	4,100	6.75	6,300
3	....	....	....	....	2.00	375	3.15	1,200	5.72	4,310	6.77	6,340
4	....	....	....	....	2.00	375	3.87	1,900	5.65	4,190	6.25	5,280
5	....	....	....	....	2.00	375	4.12	2,150	5.65	4,190	5.80	4,450
6	....	....	....	....	2.00	375	4.10	2,130	5.65	4,190	5.55	4,020
7	....	....	....	....	2.00	375	4.15	2,180	5.60	4,100	5.50	3,940
8	....	....	....	....	2.00	375	4.28	2,320	6.00	4,810	5.50	3,940
9	....	....	....	....	2.00	375	4.22	2,260	6.15	5,090	5.17	3,430
10	....	....	....	....	1.90	320	4.20	2,230	6.20	5,190	5.00	3,200
11	....	....	....	....	1.90	320	4.20	2,230	6.62	6,030	4.82	2,950
12	....	....	....	....	1.90	320	4.30	2,340	6.15	5,090	4.70	2,800
13	....	....	....	....	1.90	320	4.75	2,860	5.72	4,310	4.70	2,800
14	....	....	....	....	1.90	320	5.06	3,280	5.70	4,270	4.70	2,800
15	....	....	....	....	1.90	320	4.90	3,060	6.70	6,190	4.70	2,800
16	....	....	....	....	2.00	375	4.90	3,060	6.37	5,510	4.50	2,560
17	....	....	....	....	2.00	375	5.15	3,410	6.05	4,900	4.50	2,560
18	....	....	....	....	2.10	430	5.63	4,150	6.00	4,810	4.25	2,280
19	....	....	....	....	2.10	430	5.75	4,360	7.05	6,950	4.20	2,230
20	....	....	....	....	1.95	355	6.00	4,810	8.02	9,130	4.70	2,800
21	....	....	....	....	1.95	355	6.10	5,000	7.72	8,440	4.40	2,450
22	....	....	....	....	1.95	355	5.60	4,100	7.70	8,400	4.35	2,390
23	....	....	....	....	2.05	400	5.25	3,550	7.47	7,880	4.10	2,130
24	....	....	....	....	2.10	430	5.20	3,480	7.20	7,280	4.00	2,030
25	....	....	....	....	2.25	520	5.00	3,200	7.20	7,280	3.90	1,930
26	....	....	....	....	2.30	550	4.90	3,060	7.25	7,390	4.00	2,030
27	....	....	....	....	2.30	550	4.87	3,020	6.90	6,620	4.30	2,340
28	....	....	....	....	2.30	550	4.85	2,990	6.85	6,510	5.00	3,200
29	....	....	....	....	2.30	550	4.90	3,060	8.20	9,560	4.90	3,060
30	....	....	....	....	2.35	590	6.05	4,900	7.40	7,730	4.85	2,990
31	....	....	....	....	2.40	620	....	....	6.82	6,450	....	....

	July.		August.		September.		October.		November.		December.	
1	4.5	2,560	4.15	2,180	2.15	460	1.90	320	2.40	620	....	....
2	4.25	2,280	3.90	1,930	2.15	460	1.90	320	2.35	590	....	....
3	4.05	2,080	3.85	1,880	2.15	460	1.95	350	2.30	555	....	....
4	4.00	2,030	3.70	1,730	2.10	430	1.85	300	2.30	555	....	....
5	4.00	2,030	3.65	1,680	2.10	430	1.95	350	2.25	520	....	....
6	4.00	2,030	3.60	1,630	2.10	430	1.95	350	....	535	....	....
7	4.30	2,340	3.45	1,480	2.00	375	1.90	320	2.30	555	....	....
8	4.30	2,340	3.30	1,340	2.00	375	1.90	320	2.25	520	....	....
9	4.20	2,230	3.20	1,240	1.95	345	1.90	320	2.20	490	....	....
10	4.80	2,930	3.10	1,150	1.95	345	1.90	320	2.20	490	....	....
11	4.50	2,560	3.00	1,070	1.95	345	1.90	320	2.20	490	....	....
12	4.30	2,340	2.95	1,030	2.15	460	1.90	320	2.20	490	....	....
13	4.15	2,180	2.90	990	2.00	375	2.00	375	2.00	375	....	....
14	4.35	2,390	2.80	910	2.00	375	2.00	375	1.90	320	....	....
15	4.40	2,450	2.70	830	2.00	375	2.00	375	Ice	320	....	....
16	4.65	2,740	2.70	830	2.00	375	2.00	375	Ice	320	....	....
17	5.27	3,580	2.60	760	2.00	375	2.10	430	2.00	375	....	....
18	5 30	3,630	2.60	760	2.00	375	2.05	400	2.00	375	....	....
19	5.00	3,200	2.60	760	2.25	520	2.05	400	2.05	400	....	....
20	4.75	2,860	2.60	760	2.05	400	2.10	430	2.05	400	....	....
21	4.60	2,680	2.50	680	2.05	400	2.10	430	2.05	400	....	....
22	4.35	2,390	2.40	620	2.00	375	2.10	430	2.25	520	....	....
23	4.15	2,180	2.40	620	2.00	375	2.15	460	2.25	520	....	....
24	3.90	1,930	2.45	650	2.00	375	2.15	460	2.25	520	....	....
25	3.80	1,830	2.30	550	1.95	345	2.15	460	2.30	555	....	....
26	3.75	1,780	2.30	550	....	345	2.20	490	2.05	400	....	....
27	3.90	1,930	2.30	550	1.95	345	2.40	620	Ice	400	....	....
28	4.02	2,050	2.20	490	1.95	345	2.50	685	....	400	....	....
29	4.22	2,250	2.20	490	1.95	345	2.45	650	....	400	....	....
30	4.20	2,230	2.20	490	1.95	345	2.45	650	....	400	....	....
31	4.10	2,130	2.15	460	....	....	2.50	685	....	....	....	....

Monthly Discharge of Kettle River at Carson for 1915.

(Drainage area, 3,010 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	620	320	414	0.14	0.16	25,500
April	5,000	760	2,930	0.97	1.08	174,000
May	9,560	4,100	5,980	1.98	2.28	368,000
June	6,340	1,930	3,274	1.08	1.20	195,000
July	3,630	1,780	2,392	0.79	0.91	147,000
August	2,180	460	1,003	0.33	0.38	61,600
September	520	345	389	0.13	0.14	23,100
October	685	320	422	0.14	0.16	26,000
November	620	320	460	0.15	0.17	27,400
The period	9,560	320	1,918	0.63	6.48	1,047,600

MANSON CREEK.—(2074).

Location.—Section 14, township 23, range 10, west 6th meridian.

Records Available.—April 26 to September 30, 1915.

Drainage Area.—Twenty-four square miles.

Gauge.—Vertical staff read daily by H. Noakes.

Channel.—Rocks and gravel; current swift at high water.

Discharge Measurements.—Four measurements were taken during 1915. The two highest ones do not agree very well and are much below the highest stage for the season.

Winter Flow.—This stream is used for irrigation only, and no attempt is made to keep up the records during the winter.

Accuracy.—Rather poor except at low water. The stream is not considered of very great importance.

Discharge Measurements of Manson Creek 1 Mile from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 26	K. G. Chisholm	1,915	15	19.7	3.6	1.85	70.8
June 5	E. M. Dann	1,055	16	18.9	3.9	1.70	73.4
July 17	Archibald & Mason	1,055	16	18.6	3.2	1.58	59.8
Oct. 7	Tredcroft & Cline	1,915	11	5.1	1.1	0.80	5.3

Daily Gauge Height and Discharge of Manson Creek 1 Mile above Mouth for 1915.

(Drainage area, 24 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	....	1.8	78	1.8	78	1.4	40	1.1	20	0.8	5
2	......	....	1.8	78	1.7	67	1.3	33	1.1	20	0.8	5
3	......	....	1.9	89	1.7	67	1.3	33	1.1	20	0.8	5
4	......	....	1.9	89	1.7	67	1.3	33	1.1	20	0.8	5
5	......	....	1.9	89	1.8	78	1.2	26	1.1	20	0.8	5
6	......	....	2.0	101	1.8	78	1.2	26	1.1	20	0.8	5
7	......	....	2.0	101	1.8	78	1.2	26	1.0	15	0.8	5
8	......	....	2.0	101	1.7	67	1.2	26	1.0	15	0.8	5
9	......	....	2.1	113	1.6	58	1.2	26	1.0	15	0.8	5
10	......	....	2.3	139	1.6	58	1.2	26	1.0	15	0.8	5
11	......	....	2.0	101	1.5	49	1.3	33	1.0	15	0.8	5
12	......	....	1.95	95	1.5	49	1.2	26	0.9	10	0.8	5
13	......	....	1.90	89	1.4	40	1.3	33	0.9	10	0.8	5
14	......	....	2.10	113	1.5	49	1.3	33	0.9	10	0.8	5
15	......	....	2.20	126	1.6	58	1.85	83	0.9	10	0.8	5
16	......	....	1.90	89	1.5	49	1.9	89	0.9	10	0.8	5
17	......	....	1.90	89	1.85	83	1.7	67	0.9	10	0.8	5
18	......	....	1.90	89	1.7	67	1.6	58	0.9	10	0.8	5
19	......	....	2.0	101	1.6	58	1.5	49	0.9	10	0.8	5
20	......	....	2.15	119	1.6	58	1.4	40	0.9	10	0.8	5
21	......	....	2.1	113	1.5	49	1.4	40	0.9	10	0.8	5
22	......	....	2.1	113	1.5	49	1.4	40	0.9	10	0.8	5
23	......	....	1.9	89	1.4	40	1.3	33	0.9	10	0.8	5
24	......	....	1.9	89	1.4	40	1.3	33	0.9	10	0.8	5
25	......	....	1.9	89	1.4	40	1.2	26	0.8	5	0.8	5
26	1.9	89	1.9	89	1.7	67	1.2	26	0.8	5	0.8	5
27	1.8	78	1.8	78	1.6	58	1.2	26	0.8	5	0.8	5
28	1.9	89	2.1	113	1.6	58	1.3	33	0.8	5	0.8	5
29	1.9	89	1.9	89	1.5	49	1.2	26	0.8	5	0.8	5
30	1.9	89	1.8	78	1.4	40	1.2	26	0.8	5	0.8	5
31	......	....	1.8	78	......	....	1.2	26	0.8	5	......	....

Monthly Discharge of Manson Creek 1 Mile from Mouth for 1915.

(Drainage area, 24 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	139	78	97	4.04	4.66	5,960
June	83	40	58	2.42	2.70	3,450
July	89	26	37	1.54	1.77	2,270
August	20	5	12	0.50	0.58	740
September	5	5	5	0.21	0.23	300
The period	139	5	42	1.74	9.94	12,720

NISKONLITH CREEK.—(2031).

Location.—Section 5, township 21, range 13, west 6th meridian.

Records Available.—September 1 to December 31, 1911; April 1 to September 13, 1912; May 1 to September 30, 1913; April 1 to December 11, 1914; April 1 to September 30, 1915.

Drainage Area.—Fifty square miles.

Gauge.—Vertical staff gauge read semi-weekly by H. Hoffman.

Channel.—The stream bed is composed of large rocks and boulders.

Discharge Measurements.—Seven measurements made during 1911-12 and 1915 agree very well and cover all ranges of stage for 1915.

Accuracy.—Except for the fact that the gauge readings are not taken every day, the results should be quite reliable. However, there are diversions above the station which affect the flow for part of the irrigation season.

Winter Flow.—Ice conditions prevail during last half of December, January, February and March.

Discharge Measurements of Niskonlith Creek near Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Aug. 28	C. G. Cline	1,046	10	9.2	0.5	0.66	4.4
1912							
April 11	Cline & Dann	1,046	1	0.2	0.6	0.30	0.1
May 20	E. M. Dann	1,044	8	17.9	3.7	1.92	66.9
1915							
May 20	F. R. Archibald	1,673	11	7.2	1.2	0.85	8.8
June 2	E. M. Dann	1,055	10	6.7	1.3	0.83	8.5
July 14	Archibald & Mason	1,055	10	3.3	0.4	0.50	1.3
July 28	Mason & Archibald	1,055	10	3.2	0.6	0.54	1.8

Daily Gauge Height and Discharge of Niskonlith Creek near Mouth for 1915.

(Drainage area, 50 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.55	1.9			0.85	9.3						
2							0.50	1.1				
3			1.00	14.7					0.50	1.1	1.00	14.7
4					1.00	14.7						
5	0.55	1.9										
6							0.50	1.1	0.50	1.1		
7											0.95	12.8
8			1.00	14.7	1.00	14.7						
9	0.57	2.2					0.50	1.1				
10									0.70	5.0	0.97	13.6
11			1.00	14.7	1.10	18.8						
12	0.57	2.2										
13							0.50	1.1	0.70	5.0	0.92	11.7
14												
15			0.95	12.8	1.15	21.0						
16	0.52	1.4										
17							0.50	1.1	0.70	5.0	0.90	10.9
18	1.05	16.7	0.90	10.9	1.15	21.0						
19												
20							0.50	1.1	0.75	6.3		
21			0.90	10.9							0.90	10.9
22					1.15	21.0						
23	1.02	15.5					0.50	1.1				
24									0.70	5.0	0.90	10.9
25			0.90	10.9	1.15	21.0						
26	1.02	15.5										
27							0.50	1.1	1.00	14.7		
28			0.90	10.9							0.50	1.1
29					1.15	21.0						
30	1.00	14.7					0.50	1.1				
31									1.00	14.7		

NOTE.—Artificial storage and diversions above station.

OKANAGAN RIVER, AT OKANAGAN FALLS.—(2088).

Location.—Three hundred feet above Okanagan Falls; Water District No. 4.

Records Available.—April 8 to December 31, 1914; at original station near Fairview; January 1 to December 31, 1915, at Okanagan Falls.

Gauge.—The gauging station was transferred on March 17, 1915, from its original location near Fairview to its present position above Okanagan Falls, on account of the shifting channel at the old station. Gauge readings for 1915, prior to the change, have been transferred to the new station. A standard vertical staff gauge six feet long has been installed and is read four or five times a week by A. S. Hatfield, stage driver.

Channel.—The bed of the stream at the gauge is composed of clean gravel and the current is moderately slow at all stages. An excellent control is formed by the brink of the falls.

Discharge Measurements.—Four meter measurements have been taken during 1915 and they cover the entire range of stage except between discharges of 500 and 1,000 cubic feet per second.

Winter Flow.—Open water conditions obtained all year round during 1915.

Accuracy.—The results should be quite reliable and within the limits of error indicated for the various months.

Discharge Measurements of Okanagan River at Okanagan Falls.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 17	K. G. Chisholm	1,915	238	466	0.88	2.38	414
Mar. 26	K. G. Chisholm	1,915	238	467	0.86	2.37	402
April 11	K. G. Chisholm	1,915	238	486	0.96	2.50	468
June 7	E. H. Tredcroft	1,923	250	688	1.47	3.40	1,020

Daily Gauge Height and Discharge of Okanagan River at Okanagan Falls for 1915.

(Drainage area, 3,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	492	2.45	442	2.45	442	2.35	400	2.75	600	3.55	1,120
2	....	492	2.45	442	2.45	442	2.40	420	....	600	3.50	1,080
3	....	492	2.45	442	2.45	442	2.40	420	2.75	600	3.50	1,080
4	2.55	492	2.45	442	2.45	442	....	420	2.80	630	3.45	1,040
5	2.55	492	....	442	....	442	2.45	442	2.80	630	3.45	1,040
6	2.55	492	....	442	....	442	2.45	442	2.80	630	....	1.040
7	2.55	492	....	442	....	442	2.45	442	2.80	630	3.40	1,010
8	....	492	2.45	442	2.45	442	2.45	442	2.85	660	3.40	1,010
9	....	492	2.45	442	2.45	442	2.45	442	....	660	3.40	1,010
10	....	520	2.45	442	2.45	442	2.50	465	2.95	720	3.35	970
11	2.60	520	2.45	442	2.45	442	....	465	2.95	720	3.35	970
12	2.60	520	....	442	....	442	2.50	465	2.95	720	3.35	970
13	2.55	492	....	442	....	442	2.55	492	3.00	750	....	970
14	2.55	492	....	442	....	442	2.55	492	3.00	750	3.30	940
15	....	492	2.45	442	2.45	442	2.55	492	3.05	780	3.30	940
16	....	492	2.45	442	2.45	442	2.60	520	....	780	3.30	940
17	....	492	2.45	442	2.40	420	2.60	520	3.10	810	3.30	940
18	2.55	492	2.40	420	2.40	420	2.60	520	3.15	840	3.30	940
19	2.55	492	....	420	2.40	420	2.60	520	3.25	910	3.30	940
20	2.55	492	....	420	2.40	420	2.60	520	3.40	1,010	....	940
21	2.50	465	....	420	....	420	2.60	520	3.40	1,010	3.30	940
22	....	465	2.40	420	2.40	420	2.65	545	3.45	1,040	3.30	940
23	....	465	2.40	420	2.35	400	2.65	545	....	1,040	3.25	910
24	....	465	2.40	420	2.35	400	2.65	545	3.50	1,080	3.25	910
25	2.50	465	2.40	420	2.35	400	....	545	3.50	1,080	3.25	910
26	2.50	465	....	420	2.35	400	2.65	545	3.50	1,080	3.20	880
27	2.50	465	....	420	2.35	400	2.70	570	3.50	1,080	....	880
28	2.50	465	....	420	....	400	2.70	570	3.55	1,120	3.20	880
29	....	465	....	....	2.35	400	2.70	570	3.60	1,160	3.25	910
30	....	465	....	....	2.35	400	2.75	600	3.55	1,120	3.30	940
31	....	465	....	....	2.35	400	....	....	....	1,120	....	....

	July.		August.		September.		October.		November.		December.	
1	3.25	910	....	840	2.80	630	2.60	520	2.50	460	2.45	440
2	3.25	910	3.15	840	2.80	630	2.60	520	2.50	460	2.47	450
3	3.25	910	3.15	840	2.80	630	....	510	2.52	470	2.47	450
4	....	910	3.10	810	2.80	630	2.57	500	2.52	470	2.50	460
5	3.20	880	3.10	810	....	630	2.57	500	2.52	470	....	460
6	3.20	880	3.10	810	2.75	600	2.57	500	2.52	470	2.50	460
7	3.20	880	3.05	780	2.75	600	2.57	500	....	470	2.50	460
8	3.15	840	....	780	2.75	600	2.55	490	2.52	470	2.50	460
9	3.20	880	3.00	750	2.75	600	2.52	470	2.52	470	2.47	450
10	3.15	840	3.00	750	2.75	600	....	470	2.50	460	2.47	450
11	....	840	3.00	750	2.75	600	2.52	470	2.50	460	2.45	440
12	3.15	840	3.00	750	2.75	600	2.50	460	2.47	450	....	440
13	3.20	880	3.00	750	2.70	570	2.50	460	2.42	430	2.45	440
14	3.15	840	2.95	720	2.65	545	2.50	460	....	430	2.45	440
15	3.15	840	....	720	2.65	545	2.50	460	2.42	430	2.42	430
16	3.15	840	2.95	720	2.70	570	2.50	460	2.42	430	2.42	430
17	3.15	840	2.95	720	2.70	570	....	460	2.42	430	2.40	420
18	....	840	2.95	720	2.70	570	2.50	460	2.42	430	2.40	420
19	3.20	880	2.95	720	....	570	2.50	460	2.47	450	2.40	420
20	3.20	880	2.95	720	2.65	545	2.50	460	2.47	450	2.40	420
21	3.20	880	2.95	720	2.65	545	2.50	460	....	450	2.40	420
22	3.15	840	....	720	2.65	545	2.50	460	2.47	450	2.37	410
23	3.15	840	2.95	720	2.65	545	2.50	460	2.47	450	2.37	410
24	3.15	840	2.90	690	2.60	520	....	460	2.47	450	2.37	410
25	....	840	2.90	690	....	520	2.50	460	2.47	450	2.37	410
26	3.10	810	2.90	690	2.60	520	2.50	460	2.47	450	....	405
27	3.10	810	2.90	690	2.60	520	2.50	460	2.47	450	2.35	400
28	3.10	810	2.85	660	2.60	520	2.50	460	....	440	2.35	400
29	3.10	810	....	660	2.60	520	2.50	460	2.45	440	2.35	400
30	3.20	880	2.85	660	2.60	520	2.50	460	2.45	440	2.35	400
31	3.15	840	2.85	660	....	....	....	460	....	....	2.35	400

Okanagan falls, Okanagan river.

Murtle river, erecting cable car.

Monthly Discharge of Okanagan River at Okanagan Falls for 1915.

(Drainage area, 3,000 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	520	465	485	0.16	0.19	29,800
February	442	420	433	0.14	0.15	24,000
March	442	400	426	0.14	0.16	26,200
April	600	400	497	0.16	0.18	29,600
May	1,160	600	850	0.28	0.33	52,300
June	1,120	880	966	0.32	0.36	57,500
July	910	810	857	0.28	0.33	52,700
August	840	660	737	0.25	0.29	45,300
September	630	520	570	0.19	0.21	33,900
October	520	460	473	0.16	0.18	29,100
November	470	430	451	0.15	0.17	26,800
December	460	400	429	0.14	0.16	26,400
The year	1,160	400	598	0.20	2.71	433,600

Ross Creek.—(2077).

Location.—Two miles from mouth; section 20, township 23, range 9, west 6th meridian.

Records Available.—April 27 to September 30, 1915.

Drainage Area.—Fifty-six square miles.

Gauge.—Vertical staff read daily by Jas. Tetlow.

Channel.—Rocks and gravel, deep pool at the gauge.

Discharge Measurements.—Four measurements made during 1915 define the rating curve between discharges of 180 and 240 and also at 7 cubic feet per second.

Accuracy.—"C" (on account of insufficient measurements at certain stages). This stream is not considered very important.

Discharge Measurements of Ross Creek 2 Miles from Mouth.

Date.	Engineer.	Meter No	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 27	K. G. Chisholm	....	27	50	3.78	4.45	189
June 8	E. M. Dann	1,053	28	53	3.71	4.58	197
July 17	Archibald & Mason	1,055	20	48	4.70	4.70	227
Oct. 7	Tredcroft & Cline	1,915	20	18	0.36	2.95	7

Daily Gauge Height and Discharge of Ross Creek 2 Miles from Mouth for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	4.5	190	4.8	245	4.0	125	3.7	84	3.0	11
2	....	....	4.6	210	4.7	225	4.0	125	3.6	72	3.0	11
3	....	....	4.7	225	4.6	210	3.9	110	3.6	72	3.0	11
4	....	....	4.7	225	4.6	210	3.8	97	3.6	72	....	11
5	....	....	4.8	245	4.6	210	3.8	97	3.5	60	3.0	11
6	....	....	4.9	265	4.6	210	3.7	84	3.4	49	3.0	11
7	....	....	4.9	265	4.8	245	3.7	84	3.4	49	3.0	11
8	....	....	5.3	350	4.7	225	3.7	84	3.4	49	3.0	11
9	....	....	5.2	330	4.4	175	3.7	84	3.4	49	3.0	11
10	....	....	5.4	370	....	170	3.6	72	3.3	39	3.0	11
11	....	....	5.1	305	4.3	165	3.8	97	3.3	39	3.0	11
12	....	....	4.9	265	4.3	165	3.9	110	3.3	39	3.0	11
13	....	....	4.8	245	4.4	175	4.0	125	3.3	39	3.0	11
14	....	....	5.0	285	4.6	210	4.2	150	3.2	29	3.2	29
15	....	....	5.2	330	4.6	210	4.8	245	3.2	29	3.2	29
16	....	....	4.9	265	4.7	225	5.1	305	3.2	29	3.1	20
17	....	....	4.8	245	4.7	225	4.8	245	3.2	29	3.0	11
18	....	....	4.8	245	4.4	175	4.6	210	3.2	29	3.0	11
19	....	....	5.1	305	4.3	165	4.4	175	3.3	39	3.0	11
20	....	....	5.2	330	4.4	175	4.3	165	3.2	29	3.1	20
21	....	....	5.2	330	4.3	165	4.2	150	3.2	29	3.1	20
22	....	....	5.1	305	4.2	150	4.1	135	3.2	29	3.0	11
23	....	....	5.0	285	4.1	135	4.0	125	3.1	20	3.0	11
24	....	....	5.0	285	4.1	135	3.9	110	3.1	20	3.0	11
25	....	....	5.1	305	4.0	125	3.9	110	3.1	20	3.0	11
26	....	....	5.0	285	4.1	135	3.8	97	3.1	20	3.0	11
27	4.3	165	4.9	265	4.3	165	3.8	97	3.0	11	3.0	11
28	4.7	225	5.1	305	4.3	165	3.9	110	3.0	11	3.0	11
29	4.8	245	5.2	330	4.2	150	3.8	97	3.0	11	3.0	11
30	4.9	265	5.0	285	4.2	150	3.7	84	3.0	11	3.0	11
31	....	....	4.8	245	....	....	3.7	84	3.0	11	....	....

	October.		November.		December.							
1	3.00	11	3.60	72	3.10	20	....	....	....	....	....	....
2	3.10	20	3.40	49	3.10	20	....	....	....	....	....	....
3	3.00	11	3.50	60	3.10	20	....	....	....	....	....	....
4	3.00	11	3.50	60	3.10	20	....	....	....	....	....	....
5	3.00	11	3.40	49	3.00	11	....	....	....	....	....	....
6	3.00	11	3.40	49	3.00	11	....	....	....	....	....	....
7	3.00	11	3.30	39	3.10	20	....	....	....	....	....	....
8	2.90	3	3.30	39	3.20	29	....	....	....	....	....	....
9	2.90	3	3.20	29	3.30	39	....	....	....	....	....	....
10	2.90	3	3.20	29	3.10	20	....	....	....	....	....	....
11	2.90	3	3.10	20	3.10	20	....	....	....	....	....	....
12	2.90	3	3.10	20	3.10	20	....	....	....	....	....	....
13	2.95	7	3.00	11	3.10	20	....	....	....	....	....	....
14	3.30	39	3.20	29	3.10	20	....	....	....	....	....	....
15	3.10	20	3.20	29	3.10	20	....	....	....	....	....	....
16	3.00	11	3.20	29	3.00	11	....	....	....	....	....	....
17	3.10	20	3.20	29	3.00	11	....	....	....	....	....	....
18	3.20	29	3.10	20	3.00	11	....	....	....	....	....	....
19	3.30	39	3.10	20	3.00	11	....	....	....	....	....	....
20	3.20	29	3.10	20	3.00	11	....	....	....	....	....	....
21	3.40	49	3.10	20	3.20	29	....	....	....	....	....	....
22	3.30	39	3.10	20	3.10	20	....	....	....	....	....	....
23	3.35	44	....	20	3.10	20	....	....	....	....	....	....
24	3.40	49	3.20	29	3.00	11	....	....	....	....	....	....
25	3.40	49	3.20	29	3.00	11	....	....	....	....	....	....
26	3.80	97	3.10	20	3.00	11	....	....	....	....	....	....
27	3.60	72	3.10	20	3.00	11	....	....	....	....	....	....
28	3.60	72	3.10	20	3.00	11	....	....	....	....	....	....
29	3.60	72	3.10	20	3.00	11	....	....	....	....	....	....
30	3.50	60	3.10	20	3.10	20	....	....	....	....	....	....
31	3.70	84	....	....	3.00	11	....	....	....	....	....	....

Monthly Discharge of Ross Creek 2 Miles from Mouth for 1915.

(Drainage area, 56 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	370	190	281	5.02	5.79	17,300
June	245	125	183	3.27	3.65	10,900
July	305	72	129	2.30	2.65	7,930
August	84	11	36	0.64	0.74	2,210
September	29	11	13	0.23	0.26	770
October	97	3	32	0.57	0.66	1,970
November	72	11	31	0.55	0.61	1,840
December	29	11	17	0.30	0.35	1,040
The period	370	3	90	1.61	14.71	43,960

Scotch Creek.—(2079).

Location.—Three miles from mouth; section 3, township 23, range 11, west 6th meridian; Water District No. 2.

Records Available.—April 27 to December 31, 1915.

Drainage Area.—Two hundred and forty-five square miles.

Gauge.—Standard vertical staff read three times a week by A. Stegel.

Channel.—Small boulders, current swift.

Discharge Measurements.—Five measurements made during 1915 define the rating curve for discharges between 800 and 1,300 and also for 100 cubic feet per second.

Winter Flow.—Ice conditions during winter months.

Accuracy.—"C" (on account of insufficient measurements at certain stages). This stream is not considered very important.

Discharge Measurements of Scotch Creek 3 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 4	K. G. Chisholm	1,915	72	240	4.7	2.60	1,140
April 23	K. G. Chisholm	1,915	72	229	4.4	2.33	1,000
June 4	E. M. Dann	1,055	83	217	4.0	2.28	860
July 16	Archibald & Mason	1,055	83	264	4.6	2.80	1,200
Oct. 6	Tredcroft & Cline	1,915	71	92	1.2	0.45	110

Daily Gauge Height and Discharge of Scotch Creek 3 Miles above Mouth for 1915.

(Drainage area, 245 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	1,060	2.4	980	....	810	1.2	405	....	45
2	....	....	2.5	1,030	....	960	....	750	....	380	....	35
3	....	....	....	1,060	....	940	....	690	1.1	360	0.2	25
4	....	....	2.6	1,090	2.3	930	1.7	630	....	330	....	25
5	....	....	....	1,160	....	900	....	580	....	300	0.2	25
6	....	....	....	1,230	2.2	880	1.5	540	0.9	280	....	25
7	....	....	3.0	1,310	2.6	1,090	....	510	....	260	0.2	25
8	....	....	....	1,390	2.4	980	....	480	0.8	240	....	35
9	....	....	3.3	1,470	....	910	1.3	450	....	220	....	45
10	....	....	....	1,390	....	840	....	495	0.7	200	0.3	55
11	....	....	3.0	1,310	2.0	780	1.5	540	....	185	....	40
12	....	....	....	1,290	....	750	....	580	....	170	0.2	25
13	....	....	....	1,270	1.9	730	1.7	630	0.6	160	....	40
14	....	....	2.9	1,250	....	780	....	830	....	160	0.3	55
15	....	....	....	1,225	2.1	830	2.5	1,030	0.6	160	....	80
16	....	....	2.8	1,200	....	930	2.8	1,200	....	160	....	100
17	....	....	....	1,200	2.5	1,030	2.4	980	0.6	160	0.5	125
18	....	....	2.8	1,200	2.2	880	....	880	....	160	....	105
19	....	....	....	1,250	....	860	2.0	780	....	160	0.4	90
20	....	....	....	1,310	2.1	830	....	710	0.6	160	....	70
21	....	....	3.1	1,360	....	780	....	640	....	140	0.3	55
22	....	....	....	1,330	1.9	730	1.6	580	0.5	125	....	80
23	....	....	3.0	1,310	....	700	....	540	....	110	....	100
24	....	....	....	1,250	....	670	....	495	0.4	90	0.5	125
25	....	....	2.8	1,200	1.7	630	1.3	450	....	90	....	110
26	....	....	....	1,240	2.5	1,030	....	470	....	90	0.4	90
27	2.3	930	....	1,280	2.4	980	1.4	495	0.4	90	....	70
28	....	980	3.0	1,310	....	950	....	480	....	70	0.3	55
29	....	1,030	....	1,200	2.3	930	....	465	0.3	55	....	60
30	2.6	1,090	2.6	1,090	....	870	1.3	450	....	55	....	65
31	....	....	....	1,030	....	....	....	425	0.3	55	....	....

	October.		November.		December.	
1	0.30	55	....	280	....	135
2	....	70	0.80	240	....	110
3	0.40	90	....	230	0.40	90
4	....	90	....	215	....	90
5	0.40	90	0.70	200	0.40	90
6	....	80	....	180	....	90
7	....	70	0.60	160	0.40	90
8	0.30	55	....	140	....	80
9	....	55	0.50	125	....	70
10	0.30	55	....	100	0.30	55
11	....	55	....	75	....	55
12	0.30	55	0.30	55	0.30	55
13	....	75	....	100	....	55
14	....	100	0.60	160	0.30	55
15	0.50	125	....	140	....	55
16	....	110	0.50	125	....	55
17	0.40	90	....	110	0.30	55
18	....	125	....	100	....	90
19	0.60	160	0.40	90	0.50	125
20	....	175	....	105	....	90
21	....	190	0.50	125	0.30	55
22	0.70	200	....	105	....	55
23	....	220	0.40	90	....	55
24	0.80	240	....	90	0.30	55
25	....	300	....	90	....	50
26	1.10	360	0.40	90	Ice	50
27	....	350	....	90	....	50
28	....	335	0.40	90	Ice	50
29	1.00	320	....	120	....	50
30	....	320	0.60	160	....	50
31	1.00	320	....	....	Ice	50

Monthly Discharge of Scotch Creek 3 Miles from Mouth for 1915.

(Drainage area, 245 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	1,470	1,030	1,235	5.04	5.81	75,900
June	1,090	630	869	3.55	3.96	51,700
July	1,200	425	632	2.58	2.97	38,860
August	405	55	180	0.73	0.84	11,070
September	125	25	63	0.26	0.29	3,750
October	360	55	159	0.65	0.75	9,780
November	280	55	133	0.54	0.60	7,910
December	135	50	70	0.28	0.33	4,300
The period	1,470	50	417	1.70	15.55	203,270

SEYMOUR RIVER.—(2061).

Location.—Near the head of Seymour Arm; Water District No. 2.

Records Available.—August 17 to December 11, 1914; March 8 to December 31, 1915.

Drainage Area.—Two hundred and fifty square miles.

Gauge.—Chain gauge suspended over river on a substantial pole; read daily during freshet period and three times a week during the rest of the season. F. G. Bergen, gauge reader.

Channel.—Rocks and gravel; water swift.

Discharge Measurements.—Made from cable car installed May 1, 1915; previous measurements from boat. Nine measurements during 1914 and 1915 agree very well and cover practically all stages except for discharge above 2,200 cubic feet per second.

Winter Flow.—Ice conditions obtain during the three winter months.

Accuracy.—"C." There was some trouble with the chain gauge; discharges above 2,200 cubic feet per second are somewhat uncertain.

Discharge Measurements of Seymour River 2 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec.-ft.
1914							
Aug. 15	Chisholm & Tredcroft	1,923	138	427	2.45	2.37	1,051
1915							
Mar. 17	F. R. Archibald	1,673	130	284	2.10	1.65	605
May 1	K. G. Chisholm	1,915	107	471	3.56	3.22	1,680
May 13	K. G. Chisholm	1,915	109	568	3.60	3.65	2,040
June 9	E. M. Dann	1,055	111	571	3.56	3.67	2,040
June 10	E. M. Dann	1,055	108	495	3.21	3.25	1,590
July 18	Archibald & Mason	1,055	114	583	3.60	3.90	2,140
July 25	Archibald & Mason	1,055	104	497	3.02	3.01	1,510
Oct. 8	Tredcroft & Cline	1,915	88	294	1.44	1.22	425

Daily Gauge Height and Discharge of Seymour River 2 Miles from Mouth for 1914.

(Drainage area, 250 square miles.)

Day.	August.		September.		October.		November.		December.			
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	680	......	1,400	......	1,400	......	......	......	......
2	......	......	1.7	630	3.2	1,630	3.3	1,710	1.7	630	......	......
3	......	......	......	650	......	1,400	......	1,500	......	......	......	......
4	......	......	1.8	680	......	1,200	2.7	1,250	1.5	540	......	......
5	......	......	......	680	2.3	960	......	1,300	......	......	......	......
6	......	......	......	680	......	800	2.8	1,320	......	......	......	......
7	......	......	1.8	680	1.6	580	......	1,200	1.4	500	......	......
8	......	......	......	680	......	560	......	1,000	......	......	......	......
9	......	......	2.1	850	1.5	540	2.1	850	1.3	460	......	......
10	......	......	......	740	......	570	......	820	......	......	......	......
11	......	......	1.7	630	......	600	2.0	790	1.3	460	......	......
12	......	......	......	600	1.7	630	......	760	......	......	......	......
13	......	......	......	570	......	600	1.9	730	Ice	......	......	......
14	......	......	1.5	540	1.6	580	......	700	......	......	......	......
15	......	......	......	480	......	580	......	670	......	......	......	......
16	......	......	1.2	420	1.6	580	1.7	630	......	......	......	......
17	2.1	850	......	480	......	900	......	600	......	......	......	......
18	......	......	1.5	540	......	1,300	1.6	580	......	......	......	......
19	2.1	850	......	620	3.2	1,630	......	540	......	......	......	......
20	......	......	......	700	......	1,300	1.4	500	......	......	......	......
21	2.3	960	2.0	790	2.2	910	......	500	......	......	......	......
22	......	......	......	760	......	800	......	500	......	......	......	......
23	......	......	1.9	730	1.9	730	1.4	500	......	......	......	......
24	2.2	910	......	760	......	900	......	540	......	......	......	......
25	......	......	2.0	790	......	1,000	1.6	580	......	......	......	......
26	2.1	850	......	1,000	2.6	1,180	......	700	......	......	......	......
27	......	......	......	1,300	......	900	2.1	850	......	......	......	......
28	2.1	850	3.2	1,630	1.7	630	......	800	......	......	......	......
29	......	......	......	1,400	......	700	......	870	......	......	......	......
30	......	......	2.5	1,110	2.0	790	1.9	730	......	......	......	......
31	1.9	730	......	......	......	1,100	......	......	......	......	......	......

Monthly Discharge of Seymour River 2 Miles from Mouth for 1914.

(Drainage area, 250 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
September	1,630	420	760	3.04	3.39	45,200
October	1,630	540	903	3.61	4.16	55,500
November	1,710	500	814	3.26	3.64	48,400
The period	1,710	420	826	3.30	11.19	149,100

Daily Gauge Height and Discharge of Seymour River 2 Miles from Mouth for 1915.

(Drainage area, 250 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	....	....	2.25	930	3.30	1,710	3.60	1,950
2	....	....	....	....	....	....	4.85	2,950	....	1,750	3.90	2,190
3	....	....	....	....	....	....	4.95	3,030	3.40	1,790	3.70	2,030
4	....	....	....	....	....	....	4.05	2,310	3.60	1,950	3.75	2,070
5	....	....	....	....	....	....	3.75	2,070	4.00	2,270	3.90	2,190
6	....	....	....	....	....	....	....	1,890	4.60	2,750	....	2,700
7	....	....	....	....	....	....	3.30	1,710	4.90	2,990	5.20	3,240
8	....	....	....	....	0.75	305	....	1,570	5.20	3,240	....	2,700
9	....	....	....	....	....	325	2.95	1,430	....	3,280	3.90	2,190
10	....	....	....	....	0.95	350	....	1,400	5.30	3,320	3.25	1,670
11	....	....	....	....	....	360	....	1,375	4.90	2,990	....	1,650
12	....	....	....	....	1.05	375	2.85	1,350	3.80	2,110	3.20	1,630
13	....	....	....	....	....	430	....	1,150	3.30	1,710	....	1,830
14	....	....	....	....	....	500	2.30	960	3.60	1,950	3.70	2,030
15	....	....	....	....	1.55	560	....	1,550	4.20	2,430	....	2,860
16	....	....	....	....	1.80	680	3.85	2,150	....	2,100	5.75	3,690
17	....	....	....	....	1.65	600	....	2,175	3.50	1,870	....	3,140
18	....	....	....	....	1.80	680	....	2,200	4.00	2,270	4.40	2,590
19	....	....	....	....	1.90	730	3.95	2,230	4.80	2,910	4.00	2,270
20	....	....	....	....	....	790	....	2,330	5.30	3,320	....	2,390
21	....	....	....	....	....	850	4.20	2,430	5.20	3,240	4.30	2,510
22	....	....	....	....	2.20	910	....	1,900	4.90	2,990	3.90	2,190
23	....	....	....	....	2.50	1,110	2.95	1,430	....	2,960	3.60	1,950
24	....	....	....	....	2.45	1,070	....	1,500	....	2,930	3.80	2,110
25	....	....	....	....	....	900	....	1,550	4.80	2,910	....	2,850
26	....	....	....	....	1.90	730	3.15	1,590	4.40	2,590	5.60	3,570
27	....	....	....	....	....	680	....	1,470	4.10	2,350	....	3,150
28	....	....	....	....	....	630	2.85	1,350	5.00	3,070	4.60	2,750
29	....	....	....	....	1.60	580	....	1,850	4.60	2,750	4.00	2,270
30	....	....	....	....	1.75	650	4.05	2,310	4.00	2,270	3.70	2,030
31	....	....	....	....	1.85	700	....	....	3.80	2,110	....	....

	July.		August.		September.		October.		November.		December.	
1	3.85	2,150	....	1,500	2.20	910	....	680	2.10	850	0.90	340
2	3.70	2,030	3.10	1,550	....	910	....	630	....	820	0.90	340
3	3.60	1,950	....	1,510	2.20	910	....	580	2.00	790	0.90	340
4	3.60	1,950	3.00	1,470	....	850	1.50	540	1.90	730	0.90	340
5	3.75	2,070	....	1,380	....	790	....	530	1.70	630	....	340
6	3.80	2,110	....	1,280	1.90	730	1.45	520	....	600	0.95	350
7	....	2,110	2.60	1,180	....	660	....	470	....	570	....	370
8	3.80	2,110	....	1,070	....	600	1.20	420	1.50	540	1.10	390
9	....	2,130	2.30	960	1.50	540	....	420	....	530	....	400
10	3.85	2,150	....	940	....	450	....	420	1.45	520	1.20	420
11	....	2,170	2.20	910	1.00	360	1.20	420	....	510	....	415
12	3.90	2,190	....	950	....	390	....	400	....	510	....	410
13	....	2,390	....	1,000	1.20	420	1.10	390	1.40	500	1.15	405
14	4.40	2,590	2.40	1,040	....	520	....	430	....	490	....	380
15	....	3,050	....	1,000	1.70	630	1.35	480	1.35	480	1.00	360
16	5.55	3,520	2.30	960	....	750	....	580	....	490	1.05	375
17	....	3,070	....	1,140	2.30	960	....	680	1.40	500	....	360
18	....	2,630	2.80	1,320	....	840	2.00	790	....	500	0.90	340
19	3.90	2,190	....	1,250	....	710	2.25	930	....	500	....	350
20	....	2,130	2.60	1,180	1.60	580	2.10	850	1.40	500	1.00	360
21	3.75	2,070	....	1,100	....	520	....	830	....	490	....	345
22	....	1,930	....	1,030	1.30	460	2.05	820	1.35	480	0.85	330
23	3.40	1,790	2.30	960	....	440	....	920	....	450	....	335
24	....	1,710	....	940	1.20	420	....	1,020	1.20	420	0.90	340
25	....	1,630	2.20	910	....	410	2.50	1,110	....	400	....	330
26	3.10	1,550	....	820	....	400	....	1,070	1.10	390	....	310
27	....	1,530	1.90	730	1.10	390	2.40	1,040	1.05	370	0.65	290
28	3.05	1,510	....	790	1.20	420	....	1,050	....	350	0.80	320
29	....	1,490	....	850	1.25	440	2.45	1,070	0.90	340	....	310
30	3.00	1,470	2.20	910	1.90	730	....	960	0.85	330	0.70	300
31	....	1,500	....	910	....	....	....	900	....	....	0.60	280

Monthly Discharge of Seymour River 2 Miles from Mouth for 1915.
(Drainage area. 250 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	0,030	930	1,805	7.21	8.04	107,400
May	3,320	1,710	2,545	10.20	11.76	156,500
June	3,690	1,630	2,413	9.65	10.77	143,600
July	3,520	1,470	2,093	8.37	9.64	128,700
August	1,550	730	1,082	4.32	4.98	66,500
September	910	360	605	2.42	2.70	36,000
October	1,110	390	708	2.83	3.26	43,530
November	850	330	519	2.08	2.32	30,880
December	420	280	351	1.40	1.61	21,580
The period	3,690	280	1,347	5.39	55.08	734,690

SHUSWAP RIVER, AT ENDERBY.—(2034).

Location.—Section 26, township 18, range 9, west of 6th meridian.

Records Available.—August 25 to November 10, 1911; March 1 to December 31, 1912; April 1 to December 31, 1913; January 1 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—One thousand six hundred and fifty square miles.

Gauge.—A standard vertical staff gauge situated on highway bridge, and read daily by D. Mowat.

Channel.—The channel is straight for 100 yards at section. The rise and fall of the river each year is about 10 feet. Control is good.

Winter Conditions.—During 1915 the river remained open throughout the winter except for a few days in January, February and December.

Discharge Measurements.—Thirteen well-distributed measurements have been obtained during 1911-12-13 and -15. Measurements were made from boat except during high water, when they were made from bridge.

Accuracy.—"A" and "B." The returns are considered to be quite accurate for practically all stages.

Discharge Measurements of Shuswap River at Enderby.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec.-ft.
1911							
Aug. 25	C. E. Richardson	1,048	212	2,120	0.9	4.08	1,950
Oct. 7	C. E. Richardson	1,048	205	1,890	0.7	3.15	1,300
1912							
Feb. 28	C. E. Richardson	1,047	180	1,680	0.4	1.90	590
May 20	C. E. Richardson	1,048	283	4,970	2.3	10.65	11,400
June 16	C. E. Richardson	1,048	355	5,550	2.4	12.06	13,100
July 13	C. E. Richardson	1,048	275	3,760	1.7	7.34	6,270
Sept. 7	C. E. Richardson	1,084	245	3,160	1.1	4.60	3,280
Oct. 5	C. E. Richardson	1,055	210	1,710	1.0	3.55	1,720
1913							
May 13	C. E. Richardson	1,048	250	2,570	2.2	7.55	5,610
June 5	J. A. Elliott	1,672	328	7,016	2.6	14.60	18,700
Aug. 26	J. A. Elliott	1,672	230	2,630	1.2	5.20	3,230
1915							
April 3	K. G. Chisholm	1,915	212	1,890	1.1	4.03	2,050
Sept. 8	A. L. McNaughton	1,915	208	1,900	0.9	3.70	1,690

Daily Gauge Height and Discharge of Shuswap River at Enderby for 1915.

(Drainage area, 1,650 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.70	1,000	Ice	750	2.00	630	3.10	1,260	7.1	5,770	10.00	10,100
2	2.70	1,000	....	750	2.00	630	3.40	1,480	7.2	5,910	9.80	9,830
3	2.70	1,000	2.20	730	2.00	630	4.00	2,000	7.3	6,060	9.60	9,530
4	2.70	1,000	2.10	680	2.00	630	4.00	2,000	7.35	6,130	9.50	9,370
5	2.65	970	2.10	680	2.00	630	4.00	2,000	7.40	6,200	9.40	9,210
6	2.60	940	2.10	680	2.00	630	4.05	2,050	7.55	6,420	9.20	8,900
7	2.60	940	2.10	680	2.00	630	4.15	2,150	7.70	6,650	9.10	8,750
8	2.60	940	2.05	650	2.00	630	4.40	2,400	7.90	6,750	9.10	8,750
9	2.60	940	2.05	650	2.00	630	4.40	2,400	8.20	7,400	8.95	8,520
10	2.60	940	2.05	650	2.00	630	4.45	2,450	8.55	7,920	8.85	8,370
11	2.55	910	2.05	650	2.05	650	4.60	2,600	8.70	8,150	8.65	8,070
12	2.55	910	2.05	650	2.05	650	4.70	2,700	8.85	8,370	8.45	7,770
13	2.55	910	2.05	650	2.05	650	4.95	2,970	8.95	8,520	8.20	7,400
14	2.50	880	2.05	650	2.10	680	5.10	3,150	9.10	8,750	8.20	7,400
15	2.50	880	2.05	650	2.25	755	5.20	3,270	9.45	9,290	8.15	7,320
16	2.50	880	2.00	630	2.50	880	5.30	3,390	9.55	9,450	8.05	7,170
17	2.50	880	2.00	630	2.45	850	5.55	3,690	9.55	9,450	8.15	7,320
18	2.45	850	2.00	630	2.45	850	5.75	3,950	9.40	9,210	8.20	7,400
19	2.40	830	2.00	630	2.55	910	6.00	4,280	9.55	9,450	8.20	7,400
20	2.40	830	2.00	630	2.55	910	6.30	4,600	9.35	9,130	8.25	7,470
21	2.40	830	2.00	630	2.60	940	6.40	4,820	9.90	9,980	8.20	7,400
22	2.40	830	2.00	630	2.70	1,000	6.50	4,960	10.25	10,500	8.15	7,320
23	2.40	830	2.00	630	2.85	1,090	6.60	5,090	10.25	10,500	8.05	7,170
24	2.40	830	2.00	630	2.95	1,150	6.60	5,090	10.30	10,600	8.10	7,250
25	2.40	830	2.00	630	2.90	1,120	6.60	5,090	10.40	10,700	8.15	7,320
26	2.40	830	2.00	630	2.85	1,090	6.65	5,150	10.40	10,700	8.55	7,920
27	2.40	830	2.00	630	2.80	1,060	6.65	5,150	10.20	10,500	9.35	9,130
28	Ice	800	2.00	630	2.80	1,060	6.60	5,090	10.40	10,700	9.55	9,450
29	....	800	....	....	2.70	1,000	6.70	5,220	10.35	10,700	9.75	9,750
30	....	800	....	....	2.90	1,120	7.00	5,630	10.20	10,500	9.80	9,830
31	....	800	....	....	3.00	1,190	....	....	10.20	10,500	....	....

	July.		August.		September.		October.		November.		December.	
1	....	9,700	7.00	5,630	4.05	2,050	3.20	1,340	3.90	1,910	3.05	1,220
2	9.60	9,530	6.90	5,490	4.00	2,000	3.25	1,370	3.90	1,910	3.00	1,190
3	9.40	9,210	6.90	5,490	3.95	1,950	3.20	1,340	3.90	1,910	3.00	1,190
4	9.20	8,900	6.70	5,220	3.90	1,910	3.20	1,340	3.90	1,910	3.00	1,190
5	9.00	8,600	6.60	5,090	3.85	1,860	3.20	1,340	3.90	1,910	2.97	1,170
6	8.90	8,450	6.50	4,960	3.80	1,820	3.15	1,300	3.90	1,910	2.95	1,150
7	8.70	8,150	6.25	4,610	3.80	1,820	3.15	1,300	3.87	1,890	2.90	1,120
8	8.50	7,850	6.10	4,410	3.70	1,730	3.15	1,300	3.85	1,860	2.90	1,120
9	8.30	7,550	6.00	4,280	3.70	1,730	3.10	1,260	3.80	1,820	2.90	1,120
10	8.15	7,320	5.90	4,150	3.65	1,680	3.10	1,260	3.80	1,820	2.90	1,120
11	8.10	7,250	5.80	4,020	3.60	1,640	3.10	1,260	3.75	1,770	2.90	1,120
12	8.05	7,170	5.60	3,760	3.55	1,600	3.10	1,260	3.70	1,730	2.85	1,090
13	8.10	7,250	5.40	3,510	3.55	1,600	3.10	1,260	3.60	1,640	2.80	1,060
14	8.10	7,250	5.35	3,450	3.55	1,600	3.20	1,340	3.60	1,640	2.80	1,060
15	8.30	7,550	5.25	3,330	3.60	1,640	3.20	1,340	3.60	1,640	2.80	1,060
16	8.90	8,450	5.10	3,150	3.65	1,680	3.15	1,300	3.57	1,620	2.77	1,040
17	8.95	8,520	5.05	3,090	3.55	1,600	3.15	1,300	3.50	1,560	2.75	1,030
18	9.05	8,670	5.00	3,030	3.55	1,600	3.20	1,340	3.50	1,560	2.70	1,000
19	9.25	8,970	4.95	2,970	3.50	1,560	3.25	1,370	3.47	1,540	2.70	1,000
20	9.10	8,750	4.90	2,920	3.50	1,560	3.22	1,350	3.40	1,480	2.70	1,000
21	9.00	8,600	4.80	2,810	3.45	1,520	3.30	1,410	3.40	1,480	2.70	1,000
22	8.85	8,370	4.70	2,700	3.40	1,480	3.30	1,410	3.40	1,480	2.70	1,000
23	8.65	8,070	4.60	2,600	3.35	1,440	3.35	1,440	3.35	1,440	2.67	980
24	8.50	7,850	4.55	2,500	3.35	1,440	....	1,500	3.30	1,410	2.62	950
25	8.25	7,470	4.50	2,500	3.35	1,440	3.50	1,560	3.25	1,370	2.70	1,000
26	7.90	7,020	4.40	2,400	3.35	1,440	3.57	1,620	3.20	1,340	2.65	970
27	7.90	6,950	4.35	2,350	3.30	1,410	3.70	1,730	3.20	1,340	2.60	940
28	7.75	6,720	4.30	2,300	3.25	1,370	3.70	1,730	3.15	1,300	2.65	970
29	7.50	6,350	4.20	2,200	3.20	1,340	3.72	1,750	3.17	1,320	2.65	970
30	7.20	5,910	4.20	2,200	3.20	1,310	3.77	1,790	3.10	1,260	Ice	950
31	7.20	5,910	4.10	2,100	....	....	3.80	1,820	....	....	Ice	950

Monthly Discharge of Shuswap River at Enderby for 1915.

(Drainage area, 1,650 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1,000	800	885	0.54	0.62	54,400
February	750	630	655	0.40	0.41	36,400
March	1,190	630	836	0.51	0.58	51,400
April	5,630	1,260	3,536	2.14	2.39	210,000
May	10,700	5,770	8,737	5.29	6.10	537,000
June	10,100	7,170	8,286	5.00	5.58	493,000
July	9,700	5,910	7,881	4.77	5.50	485,000
August	5,630	2,100	3,523	2.14	2.47	217,000
September	2,050	1,340	1,628	0.98	1.10	96,900
October	1,820	1,260	1,420	0.86	0.99	87,300
November	1,910	1,260	1,626	0.98	1.09	96,700
December	1,220	940	1,056	0.64	0.74	64,900
The year	10,700	620	3,339	2.02	27.57	2,430,000

SIMILKAMEEN RIVER.—(2054).

Location.—Near Ashnola; Water District No. 4.

Records Available.—April 8 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—Two thousand three hundred and twenty square miles.

Gauge.—Standard vertical staff gauge read by Harry Atherton, of Keremeos.

Channel.—Average width of channel at measuring section is about 210 feet. Channel is straight at the station. Bed of stream is very rocky and water turbulent even at low stages.

Discharge Measurements.—The gauge height discharge curve is very well rated by well-distributed meterings, except for very low stages (below 350 cubic feet per second).

Winter Flow.—Open water conditions obtained all winter during 1915, which was milder than usual.

Accuracy.—"B" and "C." Results should be quite reliable at practically all stages.

Discharge Measurements of Similkameen River at Ashnola.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 8	E. M. Dann	1,505	185	552	3.41	1.35	1,881
May 10	K. G. Chisholm	1,505	238	1,097	6.69	3.92	7,326
June 10	K. G. Chisholm	1,913	237	913	5.14	3.10	4,697
June 24	K. G. Chisholm	1,913	236	856	4.51	2.75	3,870
July 29	K. G. Chisholm	1,913	171	282	2.24	0.30	858
Aug. 30	K. G. Chisholm	1,913	155	261	1.38	−0.47	360
Nov. 23	K. G. Chisholm	1,673	175	375	2.08	0.20	764
1915							
April 6	K. G. Chisholm	1,915	183	550	3.97	1.40	2,165
June 6	E. H. Tredcroft	1,923	228	729	4.90	2.60	3,560

Daily Gauge Height and Discharge of Similkameen River at Ashnola for 1915.

(Drainage area, 2,320 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	-0.35	420	-0.82	220	-0.50	350	0.07	700	1.97	2,630	2.47	3,350
2	-0.35	420	-0.75	250	-0.47	365	0.22	810	1.82	2,445	2.37	3,190
3	-0.40	400	-0.65	290	-0.47	365	1.00	1,500	1.87	2,507	2.25	3,010
4	-0.37	410	-0.55	330	-0.52	340	1.77	2,380	2.07	2,760	2.27	3,040
5	-0.30	450	-0.52	340	-0.55	330	1.57	2,140	2.20	2,940	2.37	3,190
6	-0.30	450	-0.52	340	-0.55	330	1.37	1,900	2.45	3,320	2.60	3,580
7	-0.32	440	-0.52	340	-0.57	320	1.40	1,940	2.92	4,230	2.55	3,490
8	-0.30	450	-0.55	330	-0.60	310	1.40	1,940	3.15	4,840	2.37	3,190
9	-0.27	410	-0.55	330	-0.60	310	1.22	1,730	3.12	4,760	2.05	2,730
10	-0.32	440	-0.55	330	-0.57	320	1.12	1,630	3.05	4,560	1.92	2,570
11	-0.37	415	-0.55	330	-0.55	330	1.22	1,730	2.60	3,580	1.97	2,630
12	-0.40	400	-0.60	310	-0.60	310	1.35	1,880	2.30	3,090	1.87	2,510
13	-0.40	400	-0.60	310	-0.55	330	1.80	2,420	2.22	2,970	1.85	2,480
14	-0.40	400	-0.60	310	-0.55	330	1.77	2,380	2.55	3,490	1.85	2,480
15	-0.42	390	-0.65	290	-0.52	340	1.75	2,360	2.52	3,440	1.85	2,480
16	-0.47	365	-0.62	300	-0.47	365	2.05	2,735	2.42	3,270	1.77	2,380
17	-0.50	350	-0.60	310	-0.40	400	2.62	3,620	2.22	2,970	1.75	2,360
18	-0.50	350	-0.60	310	-0.35	425	2.95	4,300	2.55	3,490	1.67	2,260
19	-0.50	350	-0.60	310	-0.35	425	3.15	4,840	3.12	4,760	1.55	2,120
20	-0.57	320	-0.60	310	-0.35	425	3.47	5,790	3.40	5,570	1.42	1,960
21	-0.60	310	-0.60	310	-0.35	425	2.80	3,970	3.37	5,480	1.32	1,840
22	-0.70	270	-0.67	280	-0.25	480	2.42	3,270	3.30	5,270	1.30	1,820
23	-0.70	270	-0.72	260	0.02	660	2.20	2,940	3.15	4,840	1.30	1,820
24	-0.70	270	-0.65	290	0.77	770	2.15	2,870	3.10	4,700	1.45	2,000
25	-0.70	270	-0.57	320	0.17	770	2.10	2,800	3.27	5,180	1.42	1,960
26	-0.80	230	-0.55	330	-0.05	680	2.20	2,940	2.97	4,350	1.27	1,790
27	-0.80	230	-0.60	310	-0.05	610	2.20	2,940	2.75	3,870	1.15	1,660
28	-0.90	190	-0.55	330	-0.05	610	2.12	2,830	3.07	4,620	1.15	1,660
29	-0.90	190	....	....	-0.02	630	2.30	3,090	2.97	4,350	1.10	1,600
30	-0.90	190	....	....	0.05	680	2.20	2,940	2.72	3,810	1.00	1,500
31	-0.90	190	....	....	0.10	720	....	....	2.47	3,350	....	....

	July.		August.		September.		October.		November.		December.	
1	0.97	1,470	1.15	1,660	-0.37	415	-0.45	375	0.40	950	-0.40	400
2	0.92	1,420	1.01	1,510	-0.32	440	-0.45	375	0.90	1,400	-0.33	435
3	0.87	1,370	0.85	1,350	-0.33	435	-0.40	400	0.70	1,210	-0.20	510
4	0.97	1,470	0.70	1,210	-0.35	425	-0.25	480	0.50	1,030	-0.10	570
5	1.02	1,520	0.57	1,090	-0 40	400	-0.20	510	0.52	1,050	-0.10	570
6	0.97	1,470	0.55	1,080	-0.72	260	-0.20	510	0.47	1,010	-0.15	540
7	0.97	1,470	0.38	930	-0.47	365	-0.20	510	0.40	950	-0.20	510
8	0.82	1,320	0.35	910	-0.47	365	-0.22	500	0.15	750	-0.20	510
9	0.67	1,180	0.32	890	-0.47	365	-0.25	480	0.15	750	-0.15	540
10	0.62	1,140	0.25	830	-0.37	415	-0.27	470	0.12	730	-0.17	530
11	0.50	1,035	0.12	730	-0.30	450	-0.35	425	0.05	680	-0.25	480
12	0.52	1,050	0.10	720	-0.27	470	-0.40	400	0.05	680	-0.25	480
13	0.55	1,080	0.07	700	-0.31	445	-0.40	400	-0.15	540	-0.25	480
14	0.81	1,310	0.02	660	-0.35	425	-0.32	440	-0.07	590	-0.22	500
15	1.20	1,710	0.00	640	-0.35	425	-0.15	540	0.00	640	-0.20	510
16	1.07	1,570	-0.05	610	-0.37	415	-0.20	510	0.02	660	-0.20	510
17	1.07	1,570	-0.02	630	-0.40	400	-0.25	480	0.05	680	-0.27	470
18	0.95	1,450	-0.05	610	-0.42	390	-0.30	450	0.05	680	-0.32	440
19	0.82	1,320	-0.05	610	-0.45	375	-0.30	450	0.00	640	-0.27	470
20	0.67	1,180	-0.11	570	-0.50	350	-0.25	480	-0.07	590	-0.25	480
21	0.55	1,080	-0.12	560	-0.50	350	0.25	830	-0.15	540	-0.22	500
22	0.52	1,050	-0.15	540	-0.51	345	0.10	720	-0.20	510	-0.25	480
23	0.47	1,010	-0.20	510	-0.51	345	0.10	720	-0.15	540	-0.25	480
24	0.42	970	-0.22	500	-0.36	420	0.02	660	-0.05	610	-0.30	450
25	0.35	910	-0.25	480	-0 32	520	0.10	720	-0.10	570	-0.30	450
26	0.45	990	-0.30	450	-0.31	445	0.30	870	-0.15	540	-0.30	450
27	0.67	1,180	-0.30	450	-0.35	425	1.05	1,550	-0.22	500	-0.30	450
28	0.80	1,300	-0.32	440	-0.40	400	1.15	1,650	-0.40	400	-0.32	440
29	0.92	1,420	-0.35	420	-0.37	415	1.40	1,940	-0.40	400	-0.35	425
30	1.00	1,500	-0.37	410	-0.35	425	1.00	1,500	-0.37	415	-0.47	365
31	1.07	1,570	-0.40	400	....	....	0.65	1,160	....	....	-0.53	340

Monthly Discharge of Similkameen River at Ashnola for 1915.

(Drainage area, 2,320 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	450	190	343	0.15	0.17	21,100
February	340	220	308	0.13	0.14	17,100
March	770	310	453	0.19	0.22	27,800
April	5,790	700	2,644	1.14	1.27	157,000
May	5,570	2,445	3,918	1.69	1.95	241,000
June	3,580	1,500	2,422	1.05	1.17	144,000
July	1,710	910	1,293	0.56	0.65	79,500
August	1,660	400	745	0.32	0.37	45,800
September	520	260	404	0.17	0.19	24,000
October	1,940	375	694	0.30	0.35	42,700
November	1,400	400	675	0.29	0.32	40,200
December	570	340	476	0.20	0.23	29,300
The year	5,790	190	1,198	0.52	7.03	869,500

SOUTH SIMILKAMEEN RIVER.—(2063).

Location.—At Princeton; Water District No. 4.

Records Available.—May 14 to December 19, 1914; March 22 to November 30, 1915.

Drainage Area.—Four hundred and forty square miles.

Gauge.—Standard chain gauge situated on the highway bridgehead, by J. J. Priest, of Princeton.

Channel.—Average width of channel at measuring section is about 170 feet. Bed of stream is of gravel, with a few boulders, and not liable to shift.

Discharge Measurements.—Made with cable and 30-pound weight. The gauge height discharge curve is very well rated by well-distributed meterings.

Winter Flow.—Ice conditions existed during January, February and December.

Accuracy.—"A" and "B." Results should be quite reliable at all stages.

Discharge Measurements of South Similkameen River at Princeton.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 13	K. G. Chisholm	1,505	232	476	7.33	3.88	3,490
June 15	K. G. Chisholm	1,913	233	511	6.25	4.00	3,194
June 22	K. G. Chisholm	1,913	231	380	4.74	3.31	1,799
July 27	K. G. Chisholm	1,913	196	118	3.58	1.88	419
Sept. 2	K. G. Chisholm	1,913	112	145	1.02	1.23	149
Nov. 28	K. G. Chisholm	1,673	125	121	3.19	1.85	386
1915							
April 7	K. G. Chisholm	1,915	75	120	4.88	2.26	588
June 5	E. H. Tredcroft	1,923	104	573	2.56	2.92	1,467

Daily Gauge Height and Discharge of South Similkameen River at Princeton for 1915.

(Drainage area, 440 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	1.4	180	2.58	880	2.95	1,330
2	......	......	......	......	......	......	1.95	415	2.55	850	2.84	1,170
3	......	......	......	......	......	......	2.8	1,120	2.60	900	2.75	1,060
4	......	......	......	......	......	......	2.45	750	2.75	1,060	2.75	1,060
5	......	......	......	......	......	......	2.30	630	2.72	1,030	2.90	1,260
6	......	......	......	......	......	......	2.20	560	2.82	1,150	3.15	1,630
7	......	......	......	......	......	......	2.25	590	3.15	1,630	3.12	1,580
8	......	......	......	......	......	......	2.20	560	......	1,760	2.90	1,260
9	......	......	......	......	......	......	2.10	500	3.30	1,890	2.82	1,150
10	......	......	......	......	......	......	2.05	470	3.25	1,800	2.70	1,010
11	......	......	......	......	......	......	2.20	560	3.04	1,460	2.70	1,010
12	......	......	......	......	......	......	2.30	630	2.92	1,290	2.65	950
13	......	......	......	......	......	......	2.55	850	2.86	1,200	2.60	900
14	......	......	......	......	......	......	2.45	750	3.10	1,550	2.70	1,010
15	......	......	......	......	......	......	2.45	750	2.98	1,370	2.70	1,010
16	......	......	......	......	......	......	2.6	900	2.82	1,150	2.68	990
17	......	......	......	......	......	......	2.92	1,290	2.84	1,170	2.64	940
18	......	......	......	......	......	......	2.05	1,470	3.17	1,660	2.55	850
19	......	......	......	......	......	......	3.20	1,710	3.50	2,270	2.42	730
20	......	......	......	......	......	......	3.15	1,630	3.45	2,170	2.34	660
21	......	......	......	......	......	......	3.1	1,550	3.35	1,980	2.34	660
22	......	......	......	......	1.4	180	2.95	1,330	3.35	1,980	2.35	670
23	......	......	......	......	1.4	180	2.9	1,260	3.25	1,800	2.38	690
24	......	......	......	......	1.5	210	2.8	1,120	3.20	1,710	2.52	820
25	......	......	......	......	1.4	180	2.75	1,060	3.18	1,680	2.40	710
26	......	......	......	......	1.35	165	2.75	1,060	3.15	1,630	2.32	640
27	......	......	......	......	1.35	165	2.75	1,060	3.00	1,400	2.18	550
28	......	......	......	......	1.35	165	2.68	990	3.30	1,890	2.10	500
29	......	......	......	......	1.32	155	2.70	1,010	3.10	1,550	2.10	500
30	......	......	......	......	1.32	155	2.75	1,060	3.00	1,400	2.15	530
31	......	......	......	......	1.35	165	......	......	3.00	1,400	......	......

	July.		August.		September.		October.		November.		December.	
1	2.18	550	2.00	440	1.30	150	1.25	135	1.82	350	......	......
2	2.20	560	1.94	410	1.30	150	1.22	125	1.80	340	......	......
3	2.20	560	1.94	410	1.34	160	1.30	150	1.80	340	......	......
4	2.20	560	1.88	380	1.30	150	1.42	185	1.85	365	......	......
5	2.15	530	1.80	340	1.30	150	1.50	210	1.85	365	......	......
6	2.14	520	1.76	320	1.30	150	1.50	210	1.80	340	......	......
7	2.00	440	1.72	300	1.25	135	1.48	205	1.80	340	......	......
8	1.96	420	1.65	270	1.20	120	1.45	195	1.75	315	......	......
9	1.92	400	1.62	260	1.17	115	1.40	180	1.70	290	......	......
10	1.88	380	1.58	240	1.25	135	1.40	180	1.65	270	......	......
11	1.80	340	1.55	230	1.40	180	1.30	150	1.60	250		......
12	1.76	320	1.52	220	1.40	180	1.35	165	1.40	180		......
13	1.80	340	1.50	210	1.38	170	1.35	165	1.30	150		
14	1.90	390	1.50	210	1.35	165	1.35	165	1.40	180		
15	1.95	415	1.48	200	1.30	150	1.40	180	1.50	210		
16	1.92	400	1.45	195	1.25	135	1.40	180	1.60	250	......	
17	1.88	380	1.54	225	1.20	120	1.35	165	1.65	270		
18	1.88	380	1.50	210	1.22	125	1.35	165	1.65	270		
19	1.85	365	1.48	200	1.20	120	1.40	180	1.65	270		
20	1.82	350	1.48	200	1.08	98	1.40	180	1.65	270		
21	1.82	350	1.46	200	1.10	100	1.45	195	1.65	270		
22	1.75	315	1.46	200	1.20	120	1.45	195	1.65	270		
23	1.72	300	1.40	180	1.25	135	1.50	210	1.65	270		
24	1.68	280	1.38	170	1.27	140	1.55	230	1.65	270		
25	1.70	290	1.38	170	1.45	195	1.60	250	1.65	270		
26	1.75	315	1.35	165	1.34	160	1.65	270	1.65	270		
27	1.82	350	1.32	155	1.30	150	1.80	340	1.65	270		
28	1.88	380	1.30	150	1.25	135	2.00	440	1.65	270		
29	1.95	415	1.30	150	1.25	135	2.15	530	1.65	270		
30	2.05	470	1.30	150	1.25	135	1.98	430	1.65	270		
31	2.22	570	1.30	150	......	......	1.85	365	......	......		

Monthly Discharge of South Similkameen River at Princeton for 1915.

(Drainage area, 440 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,710	180	927	2.10	2.34	55,200
May	2,270	850	1,505	3.42	3.94	92,500
June	1,630	500	928	2.10	2.34	55,200
July	570	280	407	0.93	1.07	25,000
August	440	150	236	0.54	0.62	14,500
September	180	98	142	0.32	0.36	8.450
October	530	125	223	0.51	0.59	13,700
November	365	150	277	0.63	0.70	16,500
The period	2,270	98	581	1.32	11.96	281,050

South Thompson River, at Chase.—(2042).

Location.—Section 35, township 21, range 13, west 6th meridian.

Records Available.—April 22 to July 31, 1911; April 10 to December 31, 1912; April 12 to December 31, 1913; January 1 to 27, March 24 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—Seven thousand square miles.

Gauge.—A vertical staff gauge is read daily by Mr. W. H. Spencer of the Adams River Lumber Company, Chase, B.C.

Channel.—Above the measuring section river broadens out into Little Shuswap lake. Below section, river is straight for 200 yards.

Discharge Measurements.—Twenty well-distributed measurements have been made during 1911-12-13-14-15. Measurements are made from cable and boat.

Winter Conditions.—The Thompson, at Chase, remains partially open throughout the year except during severe winters.

Accuracy.—"A." The accuracy of returns is considered to be very high for all stages.

Discharge Measurements of South Thompson River at Chase.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Oct. 30	C. E. Richardson	1,048	415	4,450	1.30	3.46	5,780
1912							
Mar. 1	C. E. Richardson	1,047	397	3,710	0.68	1.95	2,380
May 18	C. E. Richardson	1,048	465	6,490	3.03	8.25	19,600
June 13	C. E. Richardson	1,048	465	7,190	4.29	9.91	30,800
June 21	C. E. Richardson	1,048	495	7,600	4.46	10.75	33,800
July 24	C. E. Richardson	1,048	465	6,200	3.18	7.75	19,600
Sept. 5	C. E. Richardson	1,049	445	5,180	2.25	5.73	11,600
1913							
May 12	Richardson & Elliott	1,048	460	5,780	2.26	6.25	13,100
June 10	H. J. E. Keys	1,057	500	8,390	4.50	12.27	38,100
July 7	H. J. E. Keys	1,057	500	7,850	4.10	10.75	32,400
Oct. 22	K. G. Chisholm	1,055	420	4,380	1.51	4.37	6,630
1914							
Mar. 31	Dann & Chisholm	1,505	358	3,610	0.77	2.58	2,790
1915							
Feb. 24	E. H. Tredcroft	1,923	374	3,630	0.69	2.30	2,510
April 20	K. G. Chisholm	1,915	420	4,570	1.70	4.89	7,800
May 20	F. R. Archibald	1,673	515	7,050	3.35	8.50	23,600
June 11	E. M. Dann	1,055	490	7,000	3.49	8.98	24,400
July 3	Tredcroft & McNaughton	1,915	499	5,630	4.02	8.60	22,600
July 13	Tredcroft & McNaughton	1,915	....	....	....	7.75	21,100
July 15	Archibald & Mason	1,055	488	6,630	3.09	8.35	20,500
July 26	Archibald & Mason	1,055	489	6,680	3.42	8.46	22,870

NOTE.—All measurements are referred to new gauge installed March 24th, 1914.

Daily Gauge Height and Discharge of South Thompson River at Chase for 1915.

(Drainage area, 7,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.5	4,200	2.6	2,850	2.2	2,510	2.6	2,850	6.0	12,000	9.3	26,300
2	3.5	4,200	2.6	2,850	2.2	2,510	2.7	2,960	6.0	12,000	9.3	26,300
3	3.4	4,010	2.6	2,850	2.2	2,510	2.8	3,080	6.1	12,400	9.2	25,900
4	3.4	4,010	2.6	2,850	2.2	2,510	2.9	3,210	6.2	12,800	9.2	25,900
5	3.4	4,010	2.6	2,850	2.2	2,510	3.1	3,500	6.4	13,600	9.2	25,900
6	3.3	3,830	2.6	2,850	2.2	2,510	3.2	3,660	6.4	13,600	9.2	25,900
7	3.3	3,830	2.6	2,850	2.2	2,510	3.4	4,010	6.5	14,000	9.2	25,900
8	3.3	3,830	2.6	2,850	2.2	2,510	3.5	4,200	6.7	14,800	9.2	25,900
9	3.3	3,830	2.5	2,750	2.2	2,510	3.6	4,400	6.9	15,700	9.1	25,400
10	3.3	3,830	2.5	2,750	2.2	2,510	3.7	4,610	7.1	16,500	9.1	25,400
11	3.3	3,830	2.4	2,670	2.2	2,510	3.8	4,830	7.3	17,400	9.0	25,000
12	3.3	3,830	2.4	2,670	2.2	2,510	3.9	5,060	7.4	17,800	8.9	24,500
13	3.3	3,830	2.4	2,670	2.2	2,510	4.0	5,300	7.6	18,700	8.8	24,000
14	3.2	3,660	2.4	2,670	2.2	2,510	4.0	5,300	7.7	19,100	8.7	23,600
15	3.2	3,660	2.4	2,670	2.2	2,510	4 1	5,560	7.9	20,000	8.6	23,100
16	3.1	3,500	2.4	2,670	2.2	2,510	4.2	5,830	8.0	20,500	8.6	23,100
17	3.1	3,500	2.4	2,670	2.2	2,510	4.4	6,400	8.2	21,300	8.5	22,700
18	3.1	3,500	2.4	2,670	2.2	2,510	4.5	6,700	8.2	21,300	8.6	23,100
19	3.0	3,350	2.3	2,590	2.2	2,510	4.7	7,310	8.3	21,800	8.6	23,100
20	3.0	3,350	2.3	2,590	2.2	2,510	4.8	7,620	8.5	22,700	8.5	22,700
21	3.0	3,350	2.3	2,590	2.3	2,590	5.0	8,250	8.7	23,600	8.5	22,700
22	2.9	3,210	2.3	2,590	2.3	2,590	5.2	8,900	8.9	24,500	8.4	22,200
23	2.8	3,080	2.3	2,590	2.3	2,590	5.3	9,250	....	25,000	8.3	21,800
24	2.8	3,080	2.3	2,590	2.3	2,590	5.4	9,650	....	25,500	8.2	21,300
25	2.8	3,080	2.3	2,590	2.4	2,670	5.5	10,000	9.2	25,900	8.2	21,300
26	2.8	3,080	2.3	2,590	2.4	2,670	5.5	10,000	9.2	25,900	8.2	21,300
27	2.7	2,960	2.3	2,590	2.4	2,670	5.6	10,400	9.3	26,300	8.2	21,300
28	2.7	2,960	2.3	2,590	2.5	2,750	5.7	10,750	9.3	26,300	8.4	22,200
29	2.7	2,960	....	....	2.5	2,750	5.7	10,750	9.3	26,300	8.5	22,700
30	2.7	2,960	....	....	2.5	2,750	5.8	11,200	9.4	26,800	8.5	22,700
31	2.7	2,960	....	....	2.6	2,850	....	....	9.4	26,800	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	8.6	23,100	8.0	20,500	5.5	10,000	4.15	5,700	4.00	5,300	3.60	4,400
2	8.6	23,100	7.9	20,000	5.4	9,650	4.10	5,560	4.00	5,300	3.60	4,400
3	8.6	23,100	7.8	19,600	5.4	9,650	4.05	5,430	4.00	5,300	3.60	4,400
4	8.6	23,100	7.7	19,100	5.4	9,650	4.00	5,300	4.00	5,300	3.60	4,400
5	8.6	23,100	7.6	18,700	5.3	9,250	4.00	5,300	4.00	5,300	3.60	4,400
6	8.5	22,700	7.5	18,300	5.2	8,900	4.00	5,300	4.00	5,300	3.60	4,400
7	8.5	22,700	7.4	17,800	5.2	8,900	4.00	5,300	4.00	5,300	3.50	4,200
8	8.5	22,700	7.2	17,000	5.0	8,250	4.00	5,300	4.00	5,300	3.50	4,200
9	8.4	22,200	7.1	16,500	5.0	8,250	3.90	5,060	3.95	5,180	3.50	4,200
10	8.3	21,800	7.1	16,500	4.9	7,930	3.90	5,060	3.90	5,060	3.50	4,200
11	8.3	21,800	6.9	15,700	4.8	7,620	3.90	5,060	3.90	5,060	3.50	4,200
12	8.3	21,800	6.8	15,300	4.7	7,310	3.85	4,940	3.90	5,060	3.50	4,200
13	8.2	21,300	6.7	14,800	4.6	7,000	3.80	4,830	3.90	5,060	3.50	4,200
14	8.2	21,300	6.7	14,800	4 6	7,000	3.80	4,830	3.90	5,060	3.50	4,200
15	8.3	21,800	6.6	14,400	4.5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
16	8.4	22,200	6.5	14,000	4.5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
17	8.5	22,700	6.4	13,600	4.5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
18	8.6	23,100	6.3	13,200	4.5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
19	8.6	23,100	6.3	13,200	4 5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
20	8.6	23,100	6.2	12,800	4.5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
21	8.6	23,100	6.2	12,800	4.5	6,700	3.80	4,830	3.90	5,060	3.50	4,200
22	8.6	23,100	6 1	12,400	4.5	6,700	3.80	4,830	3.80	4,830	3.50	4,200
23	8.6	23,100	6.1	12,400	4.5	6,700	3.80	4,830	3 80	4,830	3.50	4,200
24	8.6	23,100	6.0	12,000	4.5	6,700	3.80	4,830	3.80	4,830	3.50	4,200
25	8.5	22,700	5.9	11,600	4 4	6,400	3.80	4,830	3.80	4,830	3.50	4,200
26	8.5	22,700	5.9	11,600	4.4	6,400	3.80	4,830	3.70	4,610	3.40	4,010
27	8.4	22,200	5.8	11,200	4.3	6,110	3.85	4,940	3.70	4,610	3.40	4,010
28	8.4	22,200	5.8	11,200	4.3	6,110	3.90	5,060	3.70	4,610	3.40	4,010
29	8.3	21,800	5.7	10,750	4.3	6,110	3.90	5,060	3.70	4,610	3.40	4,010
30	8.2	21,300	5.6	10,400	4.2	5,830	3.90	5,060	3.70	4,610	3.30	3,830
31	8.1	20,900	5.6	10,400	....	....	4.00	5,300	....	....	3.30	3,830

Monthly Discharge of South Thompson River at Chase for 1915.

(Drainage area, 7,000 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	4,200	2,960	3,525	0.50	0.58	217,000
February	2,850	2,590	2,700	0.39	0.40	150,000
March	2,850	2,510	2,570	0.37	0.42	158,000
April	11,200	2,850	6,518	0.93	1.04	388,000
May	26,800	12,000	20,029	2.86	3.30	1,231,000
June	26,300	21,300	23,770	3.40	3.79	1,414,000
July	23,100	20,900	22,450	3.20	3.69	1,380,000
August	20,500	10,400	14,600	2.08	2.40	898,000
September	10,000	5,830	7,445	1.06	1.18	443,000
October	5,700	4,830	5,045	0.72	0.83	310,000
November	5,300	4,610	5,020	0.72	0.80	299,000
December	4,400	3,830	4,190	0.60	0.69	258,000
The year	26,800	2,510	9,822	1.40	19.12	7,146,000

TULAMEEN RIVER.—(2062).

Location.—At Coalmont; Water District No. 4.

Records Available.—May 15 to October 3, 1914; April 11 to December 31, 1915.

Drainage Area.—Four hundred square miles.

Gauge.—Chain gauge. Brass jack chain and 3-pound sash weight on downstream side of bridge at measuring section, read by J. J. Currie.

Channel.—Straight for about 700 feet at measuring section. Bed of stream of clean gravel and permanent. Average width about 100 feet.

Discharge Measurements.—Eight discharge measurements made during 1914 and 1915 agree very well indeed and cover all stages.

Winter Flow.—No winter records have been made. Ice conditions prevail on this river during the latter part of December, January and February.

Accuracy.—"B." Results should be fairly reliable. The only disturbing element was some trouble with the chain gauge.

Tulameen river. Gauging station at highway bridge.

Discharge Measurements of Tulameen River at Coalmont.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 14	K. G. Chisholm	1,505	143	601	8.82	6.91	5,300
June 14	K. G. Chisholm	1,913	118	387	4.60	5.38	1,778
June 19	K. G. Chisholm	1,913	118	333	3.84	4.98	1,277
July 26	K. G. Chisholm	1,913	80	130	1.05	3.01	137
Sept. 4	K. G. Chisholm	1,913	80	95	0.41	2.58	39
Nov. 25	K. G. Chisholm	1,673	102	181	1.73	3.51	314
1915							
April 9	K. G. Chisholm	1,915	120	257	3.21	4.33	825
June 3	E. H. Tredcroft	1,923	110	205	2.50	3.88	508

NOTE.—All measurements are referred to datum of new gauge installed April 9th, 1915 in same section as old gauge and 2.88 feet lower.

Daily Gauge Height and Discharge of Tulameen Creek at Coalmont for 1915.

(Drainage area, 400 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1									4.55	940	4.05	600
2									4.40	840	4.00	570
3									4.45	870	3.90	510
4									4.60	980	4.78	1,130
5									4.80	1,150	4.83	1,180
6									4.95	1,300	4.68	1,040
7									4.90	1,250	4.63	1,000
8									5.00	1,350	4.58	970
9									4.90	1,250	4.53	930
10									4.75	1,100	4.18	690
11							4.35	800	4.80	1,150	4.08	620
12							4.50	910	4.70	1,060	3.88	500
13							4.40	840	4.60	980	3.78	450
14							4.40	840	4.55	940	3.58	350
15							4.60	980	4.60	980	3.63	375
16							4.50	910	4.50	910	3.58	350
17							4.40	840	4.40	840	3.48	300
18							4.60	980	4.40	840	3.53	325
19							4.75	1,100	4.50	910	3.48	300
20							4.80	1,150	4.60	980	3.38	260
21							4.85	1,200	4.65	1,020	3.43	280
22							4.90	1,250	4.50	910	3.48	300
23							4.80	1,150	4.40	840	3.53	325
24							4.85	1,200	4.40	840	3.58	350
25							4.80	1,150	4.30	770	3.53	325
26							4.85	1,200	4.15	660	3.48	300
27							4.80	1,150	4.10	630	3.38	260
28							4.60	980	4.30	770	3.28	225
29							4.60	980	4.45	870	3.33	240
30							4.55	940	4.20	700	3.28	225
31									4.00	570		

Day.	July.		August.		September.		October.		November.		December.	
1	3.28	225	2.78	80	2.68	60	2.63	50	4.33	790	2.98	135
2	3.23	210	2.88	105	2.63	50	2.68	60	4.13	650	3.08	165
3	3.18	195	2.88	105	2.68	60	2.68	60	3.88	500	3.08	165
4	3.18	195	2.93	120	2.63	50	2.73	70	3.88	500	3.08	165
5	3.23	210	2.88	105	2.63	50	2.78	80	3.88	500	3.08	165
6	3.18	195	2.88	105	2.68	60	2.78	80	3.78	450	3.18	195
7	3.23	210	2.78	80	2.68	60	2.78	80	3.68	400	3.18	195
8	3.18	195	2.78	80	2.63	50	2.83	92	3.58	350	3.18	195
9	3.13	180	2.78	80	2.68	60	2.88	105	3.48	300	3.18	195
10	3.08	165	2.73	70	2.68	60	2.73	70	3.48	300	3.28	225
11	3.03	150	2.78	80	2.68	60	2.73	70	3.38	260	3.28	225
12	2.98	135	2.73	70	2.63	50	2.88	105	3.38	260	3.23	210
13	3.08	165	2.78	80	2.63	50	2.78	80	3.38	260	3.23	210
14	3.18	195	2.78	80	2.63	50	3.43	280	3.38	260	3.23	210
15	3.18	195	2.78	80	2.58	42	3.43	280	3.38	260	3.23	210
16	3.23	210	2.78	80	2.58	42	3.08	165	3.33	240	3.18	195
17	3.18	195	2.88	105	2.63	50	3.08	165	3.38	260	3.18	195
18	3.13	180	2.78	80	2.63	50	3.08	165	3.33	240	3.13	180
19	3.08	165	2.73	70	2.68	60	3.23	210	3.33	240	3.13	180
20	2.98	135	2.78	80	2.78	80	3.63	375	3.28	225	3.13	180
21	2.98	135	2.78	80	2.78	80	3.58	350	3.28	225	3.18	195
22	2.93	120	2.78	80	2.78	80	3.48	300	3.28	225	3.18	195
23	2.98	120	2.73	70	2.88	105	3.43	280	3.38	260	3.13	180
24	2.88	105	2.68	60	2.78	80	3.38	260	3.38	260	3.13	180
25	2.78	80	2.68	60	2.73	70	3.68	400	3.08	165	3.13	180
26	2.98	135	2.68	60	2.68	60	3.98	560	3.18	195	Ice	160
27	2.88	105	2.73	70	2.68	60	4.53	930	3.28	225		160
28	2.78	80	2.73	70	2.63	50	5.48	1,930	3.28	225		160
29	2.88	105	2.68	60	2.63	50	4.58	970	3.18	195		160
30	2.98	135	2.68	60	2.63	50	4.23	720	2.98	135		160
31	2.88	105	2.68	60			4.43	860				160

Monthly Discharge of Tulameen River at Coalmont for 1915.

(Drainage area, 400 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	1,350	570	942	2.35	2.71	57,900
June	1,180	225	509	1.27	1.42	30,300
July	225	80	160	0.40	0.46	9,800
August	120	60	80	0.20	0.23	4,900
September	105	42	59	0.15	0.17	3,500
October	1,930	50	329	0.82	0.94	20,200
November	790	135	312	0.78	0.87	18,600
December	225	135	183	0.46	0.53	11,300
The period	1,930	42	322	0.80	7.33	156,500

TWENTYMILE CREEK.—(2081).

Location.—Above diversion to the Nickel Plate gold mine power house and four miles from Hedley; Water District No. 4.

Records Available.—April 20 to September 30, 1915; also a few meter measurements in 1913 and 1914.

Drainage Area.—One hundred and twenty square miles.

Gauge.—Standard staff gauge read three times a week.

Channel.—Gravel and boulders; permanent control.

Discharge Measurements.—Six measurements made during 1913-14-15 agree very well and cover the whole range of stage fairly well except for discharges above 250 cubic feet per second.

Winter Flow.—Ice conditions during the winter months.

Accuracy.—"C" and "D." Gauge readings only every other day; no measurements above 250 nor between 50 and 130 cubic feet per second.

Discharge Measurements of Twentymile Creek above Intake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Nov. 5	Dann & Chisholm	1,505	25	33	3.95	0.70	13
1914							
June 12	K. G. Chisholm	1,913	27	75	3.16	2.60	236
June 23	K. G. Chisholm	1,913	37	58	2.40	2.00	140
July 28	K. G. Chisholm	1,913	26	30	1.02	0.89	30
Aug. 31	K. G. Chisholm	1,913	24	22	0.83	0.59	12
1915							
April 10	K. G. Chisholm	1,915	28	35	1.21	1.10	42

Daily Gauge Height and Discharge of Twentymile Creek above Intake for 1915.

(Drainage area, 120 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	2.2	165	....	235	1.5	76	....	95	0.9	27
2	....	....	....	150	3.2	335	....	67	1.5	76	....	24
3	....	....	2.0	135	....	320	1.3	57	....	71	0.8	21
4	....	....	....	180	3.0	300	....	72	1.4	66	....	24
5	....	....	2.6	230	....	320	1.6	86	....	66	0.9	27
6	....	....	....	200	3.2	335	....	86	1.4	66	....	27
7	....	....	2.3	180	....	375	1.6	86	....	62	0.9	27
8	....	....	....	200	3.6	415	....	86	1.3	57	....	34
9	....	....	2.6	230	....	450	1.6	86	....	57	1.1	41
10	....	....	....	230	3.3	355	....	91	1.3	57	....	37
11	....	....	2.6	230	....	330	1.7	97	....	53	1.0	34
12	....	....	....	200	3.0	300	....	103	1.2	49	....	34
13	....	....	2.3	180	....	300	1.8	110	....	49	1.0	34
14	....	....	....	200	3.4	300	....	115	1.2	49	....	30
15	....	....	2.6	230	....	280	1.9	120	....	49	0.9	27
16	....	....	....	260	2.8	265	....	100	1.2	49	....	30
17	....	....	3.0	300	....	250	1.5	76	....	41	1.0	34
18	....	....	....	330	2.6	230	....	81	1.0	34	....	30
19	....	....	3.3	355	....	220	1.6	86	....	41	0.9	27
20	1.75	105	....	355	2.5	210	....	81	1.2	49	....	27
21	....	90	3.3	355	....	170	1.5	76	....	49	0.9	27
22	1.5	76	....	330	2.0	135	....	71	1.2	49	....	34
23	....	90	3.0	300	....	140	1.4	66	....	41	1.1	41
24	1.75	105	....	260	2.1	150	....	80	1.0	34	....	37
25	....	105	2.6	230	....	110	1.7	97	....	37	1.0	34
26	1.75	105	....	240	1.5	76	....	110	1.1	41	....	30
27	....	115	2.7	245	....	76	1.9	120	....	44	0.9	27
28	2.0	135	....	240	1.5	76	....	125	1.2	49	....	27
29	....	135	2.6	230	....	70	2.0	135	....	41	0.9	27
30	2.0	135	....	250	1.4	66	....	120	1.0	34	....	27
31	....	....	2.8	265	....	....	1.8	110	....	30	....	....

Monthly Discharge of Twentymile Creek above Intake for 1915.

(Drainage area, 120 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	355	135	241	2.00	2.31	14,800
June	450	66	240	2.00	2.23	14,300
July	135	57	93	0.77	0.89	5,720
August	95	30	51	0.43	0.49	3,140
September	41	21	30	0.25	0.28	1,780
The period	450	21	131	1.09	6.20	39,740

ASHCROFT DISTRICT.

BARNES CREEK.—(2001).

Location.—Section 23, township 20, range 24, west 6th meridian.

Records Available.—April 26 to September 14, 1912; May 1 to December 14, 1913; April 1 to December 8, 1914; April 1 to September 30, 1915.

Drainage Area.—Thirty-eight square miles.

Gauge.—Standard vertical staff gauge, graduated in feet and tenths, and read daily by G. Crossley.

Channel.—Channel straight at measuring section. Velocity medium. Bed of stream permanent.

Discharge Measurements.—Seven measurements made during 1913-14-15 cover all stages but the peak of the freshet, and agree fairly well.

Winter Flow.—Ice conditions prevail on this stream during January, February and March.

Accuracy.—"C" and "D." Fairly good except for discharges above 50 cubic feet per second.

Discharge Measurements of Barnes Creek above Barnes Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
May 2	K. G. Chisholm	1,055	10.0	5.0	1.05	0.43	5.3
June 13	K. G. Chisholm	1,055	9.0	4.9	1.16	0.45	5.7
Aug. 14	K. G. Chisholm	1,055	7.5	3.7	1.09	0.40	4.1
1914							
July 6	C. B. Corbould	1,915	8.0	4.0	0.75	0.35	3.0
1915							
Mar. 31	F. R. Archibald	1,673	10.0	3.4	1.12	0.45	3.9
May 3	F. R. Archibald	1,673	12.5	7.6	2.01	0.72	15.4
Aug. 21	A. L. McNaughton	1,915	6.5	5.0	0.90	0.47	4.5

Daily Gauge Height and Discharge of Barnes Creek above Barnes Lake for 1915.

(Drainage area, 38 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.45	5.0	0.70	15.0	0.70	15.0	0.60	9.5	0.60	9.5	0.40	4.0
2	0.47	5.4	0.70	15.0	0.70	15.0	0.60	9.5	0.60	9.5	0.40	4.0
3	0.53	7.1	0.73	17.4	0.70	15.0	0.60	9.5	0.55	7.7	0.40	4.0
4	0.55	7.7	0.75	19.0	0.70	15.0	0.60	9.5	0.50	6.0	0.40	4.0
5	0.55	7.7	0.75	19.0	0.65	12.7	0.52	6.7	0.50	6.0	0.40	4.0
6	0.55	7.7	0.77	20.6	0.60	9.5	0.52	6.7	0.45	5.0	0.40	4.0
7	0.55	7.7	0.80	23.0	0.55	7.7	0.50	6.0	0.40	4.0	0.40	4.0
8	0.55	7.7	0.80	23.0	0.52	6.7	0.50	6.0	0.40	4.0	0.40	4.0
9	0.55	7.7	0.77	21.0	0.55	7.7	0.50	6.0	0.40	4.0	0.35	3.2
10	0.50	6.0	0.75	19.0	0.55	7.7	0.45	5.0	0.40	4.0	0.35	3.2
11	0.50	6.0	0.75	19.0	0.55	7.7	0.45	5.0	0.40	4.0	0.35	3.2
12	0.53	7.1	0.72	16.6	0.50	6.0	0.40	4.0	0.40	4.0	0.35	3.2
13	0.62	10.8	0.77	21.0	0.45	5.0	0.47	5.4	0.35	3.2	0.35	3.2
14	0.55	7.7	0.80	23.0	0.40	4.0	0.52	6.7	0.35	3.2	0.35	3.2
15	0.53	7.1	0.85	28.0	0.40	4.0	0.65	12.7	0.35	3.2	0.35	3.2
16	0.57	8.4	0.85	28.0	0.40	4.0	0.60	9.5	0.35	3.2	0.35	3.2
17	0.63	11.4	0.85	28.0	0.77	21.0	0.60	9.5	0.35	3.2	0.35	3.2
18	0.67	14.0	0.85	28.0	0.73	17.4	0.55	7.7	0.40	4.0	0.35	3.2
19	0.75	19.0	1.60	120.0	0.70	15.0	0.50	6.0	0.40	4.0	0.35	3.2
20	0.80	23.0	1.75	135.0	0.70	15.0	0.50	6.0	0.40	4.0	0.35	3.2
21	0.80	23.0	1.65	125.0	0.62	10.8	0.50	5.0	0.40	4.0	0.35	3.2
22	0.77	20.6	1.45	100.0	0.60	9.5	0.45	5.0	0.40	4.0	0.35	3.2
23	0.70	15.0	1.35	88.0	0.60	9.5	0.40	4.0	0.40	4.0	0.35	3.2
24	0.70	15.0	1.25	75.0	0.55	7.7	0.40	4.0	0.40	4.0	0.35	3.2
25	0.70	15.0	1.15	63.0	0.50	6.0	0.40	4.0	0.40	4.0	0.35	3.2
26	0.70	15.0	1.05	50.0	0.65	12.7	0.40	4.0	0.40	4.0	0.35	3.2
27	0.70	15.0	0.95	39.0	0.85	28.0	0.50	6.0	0.40	4.0	0.35	3.2
28	0.70	15.0	0.90	33.0	0.87	30.0	0.60	9.5	0.40	4.0	0.35	3.2
29	0.72	16.6	0.90	33.0	0.77	21.0	0.70	15.0	0.40	4.0	0.35	3.2
30	0.70	15.0	0.85	28.0	0.70	15.0	0.70	15.0	0.40	4.0	0.35	3.2
31	....	....	0.78	21.0	....	....	0.70	15.0	0.40	4.0	....	....

Monthly Discharge of Barnes Creek above Barnes Lake for 1915.

(Drainage area, 38 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	23.0	5.0	11.6	0.30	0.34	690
May	135.0	15.0	41.7	1.10	1.27	2,560
June	30.0	4.0	12.0	0.32	0.35	714
July	15.0	4.0	7.6	0.20	0.23	467
August	9.5	3.2	44.5	0.12	0.14	277
September	4.0	3.2	3.4	0.09	0.10	202
The period	135.0	3.2	20.1	0.35	2.43	4,910

BEAVER CREEK.—(2069).

Location.—Five miles above Nicola lake; Water District No. 3.

Records Available.—June 12 to September 30, 1915; station only partly rated as yet.

Drainage Area.—Eighty-three square miles.

Gauge.—Standard vertical staff read daily by D. Anderson.

Channel.—Rocks and gravel, water swift at high stages, control should be permanent.

Discharge Measurements.—Three measurements made during 1915 do not cover the higher stages (above 21 cubic feet per second), and no attempt has been made to complete these for this report. After another year's field work it should be possible to make use of these higher gauge readings if there is no shift in the channel.

Winter Flow.—Ice conditions exist during the three winter months.

Accuracy.—"B." The discharges which have been completed should be fairly reliable.

Discharge Measurements of Beaver Creek 3 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharg
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft
1915							
June 11	A. L. McNaughton	1,915	13.0	22	0.75	1.24	16.4
July 27	A. L. McNaughton	1,915	13.5	12	0.72	1.10	8.9
Dec. 17	McNaughton & Cline	1,915	14.0	6	0.60	0.80	3.5

Daily Gauge Height and Discharge of Beaver Creek 3 Miles from Mouth for 1915.

(Drainage area, 83 square miles.)

Day.	June.		July.		August.		September.					
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			1.70			12.5	0.92	4.8				
2			1.60		1.15	11.3	0.90	4.5				
3			1.60		1 15	11.3	0.87	4.2				
4			1.50		1.10	8.9	0.85	4.0				
5			1.45		1.05	7.6	0.82	3.6				
6			1.40		1.00	6.2	0.85	4.0				
7			1.35		0.95	5.3	0.85	4.0				
8			1.30	21.0	1.00	6.2	0.90	4 5				
9			1.45		1.00	6.2	0.87	4.2				
10			1.40		0.97	5.7	0.85	4.0				
11			1.30	21.0	1.00	6.2	0.85	4.0				
12	1.25	17.4	1.30	21.0	0.97	5.7	0.85	4.0				
13	1.32		1.25	17.4	0.95	5.3	0.87	4.2				
14	1.30	21.0	1.30	21.0	0.92	4.8	0.87	4.2				
15	1.30	21.0	1.30	21.0	0.90	4.5	0.85	4.0				
16	1.25	17.4	1.30	21.0	0.90	4.5	0.85	4.0				
17	1.55		1.30	21.0	0.90	4.5	0.82	3.6				
18	1.80		1.30	21.0	0.87	4.2	0.85	4.0				
19	1.77		1.25	17.4	0.90	4.5	0.82	3.6				
20	1.85		1.20	13.8	0.87	4.2	0.85	4.0				
21	1.65		1.15	11.3	0.87	4.2	0.82	3.6				
22	1.65		1.10	8.9	0.87	4.2	0.90	4.5				
23	1.60		1.10	8.9	0.87	4.2	0.87	4.2				
24	1.65		1.07	8.1	0.85	4.0	0.85	4.0				
25	1.70		1.05	7.6	0.90	4.5	0.85	4.0				
26	1.75		1.30	21.0	0.87	4.2	0.82	3.6				
27	2.00		1.10	8.9	0.85	4.0	0.82	3.6				
28	2.00		1.15	11.3	0.85	4.0	0.80	3.5				
29	1.90		1.10	8.9	0.85	4.0	0.80	3.5				
30	1.80		1.10	8.9	0.85	4.0	0.82	3.6				
31			1.20	13.8	0.85	4.0						

NOTE.—Discharge curve not yet defined above gauge height 1.3.

Monthly Discharge of Beaver Creek 3 Miles from Mouth for 1915.

(Drainage area, 83 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
August	12.5	4.0	5.6	0.07	0.08	345
September	4.8	3.5	4.0	0.05	0.06	238
The period	12.5	3.5	4.8	0.06	0.14	583

BONAPARTE RIVER.—(2003).

Location.—Section 18, township 21, range 24, west 6th meridian.

Records Available.—June 10 to November 6, 1911; March 25 to December 22, 1912; March 30 to December 31, 1913; January 1 to December 9, 1914; February 20 to December 25, 1915.

Drainage Area.—Two thousand square miles.

Gauge.—Standard vertical staff gauge read daily by H. Collins.

Channel.—Channel straight at measuring section, average width 50 feet. Velocity high.

Discharge Measurements.—Twelve measurements made in 1913-14-15 show fair agreement and cover all stages.

Winter Flow.—Ice conditions prevail on this stream during January and February.

Accuracy.—"B" and "C." Daily gauge readings and a well defined curve should give reliable results.

Discharge Measurements of Bonaparte River below Cache Creek.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
April 25	Cline & Chisholm	1,055	54	153	4.35	2.96	667
May 3	Cline & Chisholm	1,055	48	114	3.63	2.30	415
May 10	K. G. Chisholm	1,055	54	154	4.30	2.81	664
May 27	K. G. Chisholm	1,055	54	160	4.65	2.99	745
July 31	K. G. Chisholm	1,055	45	81	2.87	1.76	233
Oct. 3	K. G. Chisholm	1,055	37	51	1.67	1.08	85
1914							
May 22	C. B. Corbould	1,673	42	160	6.28	3.28	1,005
July 9	C. B. Corbould	1,915	48	107	3.30	1.98	359
1915							
Mar. 30	F. R. Archibald	1,673	42	56	1.85	1.15	103
April 24	F. R. Archibald	1,673	49	70	1.94	1.35	136
May 6	F. R. Archibald	1,673	47	60	1.76	1.23	107
Aug. 20	A. L. McNaughton	1,915	31	128	2.21	1.97	284

Daily Gauge Height and Discharge of Bonaparte River near Cache Creek for 1915.

(Drainage area, 2,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	1.40	170	1.22	120	1.35	155	2.55	520
2	......	......	......	......	1.35	155	1.27	135	1.35	155	2.47	490
3	......	......	......	......	1.35	155	1.32	145	1.35	155	2.37	455
4	......	......	......	......	1.30	140	1.32	145	1.35	155	2.35	445
5	......	......	......	......	1.30	140	1.32	145	1.35	155	2.25	415
6	......	......	......	......	1.30	140	1.35	155	1.35	155	2.20	400
7	......	......	......	......	1.30	140	1.37	160	1.30	140	2.17	390
8	......	......	......	......	1.30	140	1.40	170	1.30	140	2.20	400
9	......	......	......	......	1.30	140	1.40	170	1.32	145	2.15	385
10	......	......	......	......	1.25	125	1.40	170	1.42	175	2.10	365
11	......	......	......	......	1.25	125	1.40	170	1.47	190	2.10	365
12	......	......	......	......	1.25	125	1.40	170	1.50	195	2.10	365
13	......	......	......	......	1.25	125	1.40	170	1.50	195	2.05	355
14	......	......	......	......	1.20	115	1.40	170	1.52	200	2.05	355
15	......	......	......	......	1.15	100	1.42	175	1.67	245	2.05	355
16	......	......	......	......	1.20	115	1.45	185	1.72	255	2.02	345
17	......	......	......	......	1.27	135	1.47	190	1.75	265	2.10	365
18	......	......	......	......	1.42	175	1.50	200	1.85	295	2.17	390
19	......	......	......	......	1.32	145	1.52	200	2.17	390	2.17	390
20	......	......	1.35	155	1.37	160	1.60	225	3.05	815	2.15	385
21	......	......	1.35	155	1.37	160	1.55	210	3.05	815	2.12	375
22	......	......	1.35	155	1.37	160	1.55	210	2.95	730	2.10	365
23	......	......	1.35	155	1.37	160	1.50	195	2.87	675	2.05	355
24	......	......	1.35	155	1.37	160	1.45	185	2.92	710	2.00	335
25	......	......	1.40	170	1.37	160	1.45	185	3.00	765	2.02	345
26	......	......	1.30	140	1.27	135	1.45	185	2.87	675	2.05	355
27	......	......	1.30	140	1.27	135	1.42	175	2.80	630	2.50	500
28	......	......	1.35	155	1.27	135	1.40	170	2.77	620	2.72	590
29	......	......	......	......	1.25	125	1.40	170	2.67	570	2,82	645
30	......	......	......	......	1.25	125	1.35	155	2.60	540	2.97	745
31	......	......	......	......	1.27	135	......	......	2.60	540	......	......

	July.		August.		September.		October.		November.		December.	
1	3.02	785	2.77	615	1.55	210	1.25	130	1.20	115	1.15	100
2	2.95	730	2.72	590	1.55	210	1.25	130	1.25	130	1.20	115
3	2.77	615	2.67	570	1.50	195	1.30	140	1.25	130	1.25	130
4	2.70	580	2.57	530	1.50	195	1.30	140	1.25	130	1.35	155
5	2.65	560	2.47	490	1.50	195	1.30	140	1.25	130	1.25	130
6	2.52	505	2.32	435	1.50	195	1.30	140	1.25	130	1.15	100
7	2.47	490	2.22	400	1.50	195	1.30	140	1.20	115	1.20	115
8	2.32	435	2.15	380	1.50	195	1.25	130	1.20	115	1.30	140
9	2.17	390	2.10	365	1.47	190	1.25	130	1.15	100	1.25	130
10	2.10	365	2.05	350	1.45	185	1.25	130	1.15	100	1.20	115
11	2.10	365	2.00	335	1.45	185	1.25	130	1.30	140	1.15	100
12	2.10	365	1.95	320	1.45	185	1.25	130	1.30	140	1.15	100
13	2.10	365	1.90	305	1.40	170	1.25	130	1.15	100	1.15	100
14	2.23	405	1.85	290	1.40	170	1.25	130	1.15	100	1.15	100
15	2.48	490	1.80	275	1.40	170	1.25	130	1.15	100	1.15	100
16	2.55	520	1.75	265	1.37	160	1.25	130	1.15	100	1.15	100
17	2.60	540	1.77	270	1.35	155	1.25	130	1.20	115	1.20	115
18	2.82	645	1.90	305	1.35	155	1.25	130	1.20	115	Ice	......
19	3.02	785	1.90	305	1.35	155	1.25	130	1.20	115	Ice	......
20	3.12	880	1.90	305	1.32	145	1.25	130	1.20	115	1.15	100
21	3.15	910	1.87	300	1.30	140	1.25	130	1.20	115	1.10	90
22	3.15	910	1.80	280	1.30	140	1.25	130	1.15	100	1.05	75
23	3.07	830	1.77	270	1.30	140	1.20	115	1.15	100	1.10	90
24	2.97	745	1.75	265	1.30	140	1.20	115	1.20	115	1.20	115
25	2.87	675	1.75	265	1.30	140	1.20	115	1.20	115	1.30	140
26	2.75	605	1.70	250	1.30	140	1.20	115	1.20	115	Ice	......
27	2.67	570	1.70	250	1.30	140	1.20	115	1.15	100	......	......
28	2.67	570	1.65	235	1.30	140	1.20	115	1.45	185	......	......
29	2.75	605	1.62	230	1.25	125	1.20	115	1.10	90	......	......
30	2.80	630	1.60	225	1.25	125	1.20	115	1.45	185	......	......
31	2.87	675	1.60	225	......	......	1.20	115	......	......	Ice	......

Monthly Discharge of Bonaparte River below Cache Creek for 1915.
(Drainage area, 2,000 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	175	100	141	0.07	0.08	8,670
April	225	120	174	0.09	0.10	10,400
May	815	140	382	0.19	0.22	23,500
June	745	335	418	0.21	0.23	24,900
July	910	365	598	0.30	0.35	36,800
August	615	225	339	0.17	0.20	20,800
September	210	125	166	0.08	0.09	9,880
October	140	115	127	0.06	0.07	7,800
November	185	90	118	0.06	0.07	7,020
The period	910	90	274	0.14	1.41	149,770

CACHE CREEK.—(2071).

Location.—Section 34, township 21, range 24, west of 6th meridian; Water District No. 2. This station is above all diversions except the one to Eightmile creek, on which a regular gauging station has been established (No. 2072).

Records Available.—June 9 to September 24, 1911; April 1 to September 3, 1912; May 9 to September 30, 1915.

Drainage Area.—Thirty-five square miles, but part of the run-off is diverted to Eightmile creek.

Gauge.—Standard vertical staff gauge, read twice a week by A. C. Trimble.

Channel.—Rocks and gravel; current swift.

Discharge Measurements.—Fourteen measurements made during 1912-13 and -15 agree fairly well and cover the whole range of stage except below discharge of 2 cubic feet per second.

Winter Flow.—Ice conditions obtain during the three winter months, but as the stream is only used for irrigation it is not necessary to keep up the records during the winter.

Accuracy.—"B" and "C." Gauge readings are only taken twice a week; the rating curve is subject to a certain indefiniteness at very low stages (below 2 cubic feet per second).

Discharge Measurements of Cache Creek below McAbee's Diversion.

Date.		Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
				Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. -
1912								
May	8	C. G. Cline	1,046	15	15.4	4.2	1.65	64.6
May	13	C. G. Cline	1,046	12	15.4	3.2	1.52	49.5
June	13	Cline & Corbould	1,046	10	4.3	1.5	0.86	6.6
July	13	C. B. Corbould	1,044	8	3.4	1.5	0.85	5.2
Aug.	3	C. B. Corbould	1,044	7	2.3	1.1	0.78	2.6
Aug.	29	C. B. Corbould	1,044	7	2.1	1.1	0.77	2.3
1913								
April	26	Cline & Chisholm	1,055	12	14.0	1.2	1.10	16.7
May	15	K. G. Chisholm	1,055	11	11.7	3.7	1.40	41.5
June	9	K. G. Chisholm	1,055	12	7.5	1.6	0.99	12.2
July	30	K. G. Chisholm	1,055	11	5.7	1.1	0.85	6.4
1915								
May	5	F. R. Archibald	1,673	16	8.0	1.8	1.07	14.4
June	1	E. H. Tredcroft	1,923	14	12.2	1.3	1.10	16.3
Aug.	20	A. L. McNaughton	1,915	11	7.5	1.1	0.95	8.5
Aug.	26	A. L. McNaughton	1,915	11	5.9	0.8	0.89	4.7

Daily Gauge Height and Discharge of Cache Creek below Diversion to Eightmile Creek for 1914.

(Drainage area, 35 square miles.)

Day.	May.		June.		July.		August.		September.			
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	27	1.10	16	1.05	13	0.70	1	....	....
2	....	....	....	22	....	16	....	13	0.70	1	....	....
3	....	....	1.10	16	....	16	1.05	13	....	1	....	....
4	....	....	....	16	1.10	16	....	12	....	1	....	....
5	....	....	1.10	16	....	16	1.00	10	0.70	1	....	....
6	....	....	....	16	1.10	16	....	10	....	1	....	....
7	....	....	....	16	....	16	....	10	0.70	1	....	....
8	....	....	1.10	16	1.10	16	1.00	10	....	1	....	....
9	1.10	16	....	14	....	17	....	10	....	1	....	....
10	....	15	1.05	13	....	19	....	10	0.70	1	....	....
11	....	14	....	13	1.15	20	1.00	10	....	1	....	....
12	1.05	13	1.05	13	....	21	....	10	0.70	1	....	....
13	....	13	1.00	10	1.20	23	1.00	10	....	1	....	....
14	1.05	13	....	12	....	23	....	10	0.65	0	....	....
15	....	14	1.05	13	....	23	....	10	....	0	....	....
16	1.10	16	....	14	1.20	23	....	10	0.65	0	....	....
17	....	23	1.10	16	....	21	1.00	10	....	0	....	....
18	1.30	30	....	16	1.15	20	....	9	....	0	....	....
19	....	40	....	16	....	20	0.95	8	0.65	0	....	....
20	....	60	1.10	16	1.15	20	....	8	....	0	....	....
21	1.70	70	....	16	....	19	....	8	....	0	....	....
22	....	70	1.10	16	....	17	0.95	8	0.65	0	....	....
23	1.70	70	....	17	1.10	16	....	6	....	0	....	....
24	....	65	....	19	....	16	0.85	4	0.65	0	....	....
25	1.60	59	1.15	20	1.10	16	....	3	....	0	....	....
26	....	52	....	19	....	16	....	3	0.60	0	....	....
27	....	46	....	18	1.10	16	0.75	2	....	1	....	....
28	1.40	39	....	17	....	16	....	2	0.70	1	....	....
29	1.40	39	1.10	16	1.10	16	0.70	1	....	1	....	....
30	1.40	39	....	16	....	15	....	1	0.75	2	....	....
31	....	33	....	....	....	14	0.70	1	....	....	....	....

Monthly Discharge of Cache Creek below Diversion to Eightmile Creek for 1915.

(Drainage area, 35 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	27	10	16.1	....	....	960
July	23	14	17.9	....	....	1,100
August	13	1	7.9	....	....	490
September	2	0	0.6	....	....	40
The period	27	0	10.6	....	....	2,600

NOTE.—The discharge through the diversion from the North fork of Cache creek to Eightmile creek must be added to the discharge at the station on Cache creek to give the total run-off from the Cache creek watershed.

DIVERSION FROM CACHE CREEK TO EIGHTMILE CREEK.—(2072).

Location.—Section 12, township 22, range 24, west 6th meridian; Water District No. 2. This diversion takes water from the Cache creek above the regular gauging station (2071).

Records Available.—May 21 to July 8, 1915.

Gauge.—Vertical staff in flume is read twice a week, while the diversion is in operation, by A. C. Trimble.

Channel.—Measurements are made in a lumber flume, 2.8 feet wide.

Discharge Measurements.—On June 1, 1915, three measurements were made at high, low and intermediate stages. The flow desired was obtained by means of the headgate at the intake.

Winter Flow.—This diversion is only in use during the spring freshet.

Accuracy.—The results obtained should be quite reliable.

Discharge Measurements of Diversion from Cache Creek to Eightmile Creek.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
June 1	E. H. Tredcroft	1,923	2.8	2.8	3.4	1.00	9.4
June 1	E. H. Tredcroft	1,923	2.8	2.0	2.7	0.70	5.4
June 1	E. H. Tredcroft	1,923	2.8	1.0	1.8	0.35	1.8

Daily Gauge Height and Discharge of McAbee's Diversion of Cache Creek for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1							0.50	3.2				
2												
3					0.90	8.0						
4							0.50	3.2				
5				0.0	0.30	1.4						
6							0.50	3.2				
7					0.20	0.8						
8							0.50	3.2				
9					0.20	0.8						
10												
11												
12												
13												
14												
15												
16												
17					0.50	3.2						
18												
19												
20					0.50	3.2						
21			0.60	4.2								
22					0.40	2.2						
23			0.60	4.2								
24												
25			0.55	3.7	0.60	4.2						
26												
27		1.5			0.55	3.7						
28			0.50	3.2								
29					0.50	3.2						
30			0.45	2.7								
31												

COLDWATER RIVER.—(2006).

Location.—At Merritt; Water District No. 3.

Records Available.—April 17 to August 31, 1913; April 1 to December 6, 1914; March 17 to December 31, 1915.

Drainage Area.—Three hundred and sixty square miles.

Gauge.—Vertical staff gauge read daily by J. Skimming.

Channel.—The stream is from 50 to 75 feet wide; velocities are medium. Bed of stream is rocky and permanent.

Discharge Measurements.—Made by wading during low water, and from traffic bridge at high water. Seven measurements made during 1914 and 1915 show a good agreement and cover all stages except between 700 and 1,400 cubic feet per second.

Winter Flow.—Ice conditions exist on this river during January and February.

Accuracy.—"B" and "C." Results should be quite accurate except for certain indefiniteness in the location of the rating curve mentioned above.

Discharge Measurements of Coldwater River at Merritt.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
Mar. 2	K. G. Chisholm	1,505	68	244	5.86	3.27	1,459
July 8	K. G. Chisholm	1,913	66	151	2.78	1.69	420
July 29	C. B. Corbould	1,915	40	91	0.96	0.85	87
1915							
Feb. 9	E. H. Tredcroft	1,923	49	46	1.07	0.92	50[1]
May 4	E. M. Dann	1,055	65	148	3.60	1.85	532
June 2	E. H. Tredcroft	1,923	66	121	3.00	1.59	353
June 8	A. L. McNaughton	1,915	64	122	2.50	1.53	312
July 24	A. L. McNaughton	1,915	27	28	1.67	0.57	47

[1] Ice measurement.

Daily Gauge Height and Discharge of Coldwater River at Merritt for 1915.

(Drainage area, 360 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	....	....	1.20	195	1.75	440	1.60	360
2	....	....	....	....	....	....	1.35	250	1.70	410	1.50	310
3	....	....	....	....	....	....	1.80	470	1.65	385	1.45	290
4	....	....	....	....	....	....	2.12	680	1.85	500	1.50	310
5	....	....	....	....	....	....	1.95	570	1.95	570	1.67	400
6	....	....	....	....	....	....	1.95	570	2.12	680	1.70	410
7	....	....	....	....	....	....	1.97	580	2.42	875	1.67	400
8	....	....	....	....	....	....	1.92	550	2.65	1,020	1.47	300
9	....	....	....	5.0	....	....	1.82	480	2.30	800	1.37	260
10	....	....	....	....	....	....	1.70	410	2.22	740	1.35	250
11	....	....	....	....	....	....	1.70	410	2.02	610	1.42	280
12	....	....	....	....	....	....	1.87	520	1.87	520	1.47	300
13	....	....	....	....	....	....	2.10	670	1.82	480	1.40	270
14	....	....	....	....	....	....	1.97	580	1.90	540	1.40	270
15	....	....	....	....	....	....	1.92	550	1.87	520	1.37	260
16	....	....	....	....	....	....	2.10	670	1.72	420	1.40	270
17	....	....	....	....	0.85	103	2.45	900	1.67	400	1.30	230
18	....	....	....	....	0.85	103	2.62	1,000	1.85	500	1.25	210
19	....	....	....	....	0.85	103	2.72	1,070	2.10	670	1.15	180
20	....	....	....	....	0.85	103	2.85	1,160	2.17	710	1.10	165
21	....	....	....	....	0.85	103	2.50	930	2.10	670	1.05	150
22	....	....	....	....	0.95	125	2.20	730	1.85	500	1.05	150
23	....	....	....	....	1.10	165	2.02	610	1.85	500	0.95	125
24	....	....	....	....	1.25	210	2.00	600	1.75	440	1.02	145
25	....	....	....	....	1.25	210	1.95	570	1.90	540	1.02	145
26	....	....	....	....	1.15	180	2.10	670	1.75	440	1.00	140
27	....	....	....	....	1.15	180	2.00	600	1.70	410	0.90	115
28	....	....	....	....	1.10	165	1.90	540	1.95	570	0.90	115
29	....	....	....	....	1.15	180	1.97	580	1.80	470	0.92	120
30	....	....	....	....	1.15	180	1.87	520	1.60	360	0.90	115
31	....	....	....	....	1.20	195	....	....	1.55	335	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	0.90	115	0.75	81	0.20	8	0.25	12	1.80	470	0.55	47
2	0.90	115	0.65	63	0.20	8	0.25	12	1.55	335	0.55	47
3	0.85	105	0.60	55	0.20	8	0.40	27	1.45	290	0.85	105
4	0.95	125	0.55	47	0.17	6	0.45	47	1.30	230	0.95	125
5	0.90	115	0.50	40	0.15	5	0.60	55	1.35	250	0.85	105
6	0.80	91	0.50	40	0.15	5	0.50	40	1.25	219	0.85	105
7	0.80	91	0.45	33	0.15	5	0.60	55	1.25	210	0.75	81
8	0.75	81	0.45	33	0.15	5	0.45	33	1.20	195	0.80	91
9	0.65	63	0.40	27	0.15	5	0.40	27	1.15	180	0.70	71
10	0.65	63	0.35	22	0.20	8	0.40	27	0.70	71	0.75	81
11	0.55	47	0.35	22	0.25	12	0.40	27	0.95	125	....	72
12	0.60	55	0.35	22	0.30	16	0.40	27	0.85	105	0.65	63
13	0.60	55	0.35	22	0.25	12	0.40	27	....	125	0.70	71
14	0.70	71	0.35	22	0.25	12	0.50	40	1.05	150	0.70	71
15	0.80	91	....	19	0.25	12	0.65	63	1.05	150	0.85	105
16	0.85	105	0.30	16	0.20	8	0.65	63	0.90	115	0.85	105
17	0.75	81	0.25	12	0.20	8	0.60	55	0.95	125	0.85	105
18	0.75	81	0.25	12	0.20	8	0.55	47	0.90	115	0.90	115
19	0.65	63	0.30	16	0.20	8	0.55	47	0.90	115	0.90	115
20	0.65	63	0.30	16	0.20	8	0.65	63	0.70	71	0.80	91
21	0.65	63	0.30	16	0.20	8	0.65	63	0.65	63	0.85	105
22	0.60	55	0.30	16	0.17	6	1.00	140	0.65	63	0.85	105
23	0.60	55	0.30	16	0.20	8	1.05	150	0.90	115	0.75	81
24	0.55	47	0.25	12	0.25	12	0.95	125	0.75	81	0.75	81
25	0.50	40	0.25	12	0.30	16	0.85	105	0.85	105	0.75	81
26	0.55	47	0.25	12	0.30	16	1.25	210	0.75	81	Ice	80
27	0.60	55	0.25	12	0.25	12	1.70	410	0.65	63		75
28	0.55	47	0.22	10	0.25	12	2.40	860	0.55	47		75
29	0.65	63	0.20	8	0.25	12	2.00	600	0.65	63		70
30	0.65	63	0.20	8	0.25	12	1.60	360	0.55	47	....	65
31	0.65	63	0.20	8	....	....	1.50	310	....	....	0.65	63

Monthly Discharge of Coldwater River at Merritt for 1915.

(Drainage area, 360 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,160	195	521	1.45	1.62	31,000
May	1,020	335	549	1.53	1.76	33,800
June	410	115	235	0.65	0.72	14,000
July	125	40	73	0.20	0.23	4,490
August	81	8	24	0.07	0.08	1,480
September	16	5	9	0.02	0.03	540
October	860	12	133	0.37	0.43	8,180
November	470	47	145	0.40	0.45	8,630
December	125	47	86	0.24	0.28	5,290
The period	1,160	5	197	0.55	5.60	107,410

CRISS CREEK.—(2007).

Location.—Section 32, township 22, range 22, west 6th meridian.

Records Available.—June 14 to September 14, 1912; April 22 to November 21, 1913; April 1 to December 9, 1914; March 22 to September 30, 1915.

Drainage Area.—One hundred and fifty square miles.

Gauge.—Standard vertical staff gauge read daily by W. H. Hoey.

Channel.—The channel at measuring section is straight. Velocity is high. Bed of stream composed of gravel and boulders.

Discharge Measurements.—Thirteen measurements made during 1912-13-14-15 agree very well and cover all stages up to a discharge of 450 cubic feet per second.

Winter Flow.—Ice conditions exist on this stream during January, February and part of March.

Accuracy.—"B", "C" and "D." Results very reliable except for flood stages.

Discharge Measurements of Criss Creek near Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
July 16	B. Corbould	1,046	24	31.4	1.20	0.70	38
Aug. 5	B. Corbould	1,046	24	28.6	1.15	0.62	33
Aug. 30	B. Corbould	1,046	22	29.2	1.04	0.60	30
1913							
April 22	Cline & Chisholm	....	30	114.0	1.90	1.62	217
May 17	K. G. Chisholm	....	30	123.6	2.03	1.72	251
June 10	K. G. Chisholm	....	30	100.0	1.72	1.49	176
Aug. 15	K. G. Chisholm	....	18	26.9	1.15	0.53	31
Oct. 4	K. G. Chisholm	....	13	13.4	0.91	0.18	12
1914							
May 24	C. B. Corbould	1,673	32	77.0	5.34	2.05	412
July 10	C. B. Corbould	1,915	23	29.5	0.83	0.35	24
1915							
April 1	F. R. Archibald	1,673	21	19.2	0.61	0.30	12
April 28	F. R. Archibald	1,673	29	47.9	1.73	1.25	100
Aug. 26	A. L. McNaughton	1,915	18	12.5	0.95	0.22	12

Daily Gauge Height and Discharge of Criss Creek near Mouth for 1915.

(Drainage area, 150 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	....	....	....	30	1.20	105	1.40	150
2	....	....	....	....	....	....	....	30	1.20	105	1.30	125
3	....	....	....	....	....	....	0.60	31	1.20	105	1.30	125
4	....	....	....	....	....	....	0.60	31	1.30	125	1.20	105
5	....	....	....	....	....	....	0.65	34	1.20	105	1.20	105
6	....	....	....	....	....	....	0.65	34	1.20	105	1.10	87
7	....	....	....	....	....	....	0.70	38	1.20	105	1.00	71
8	....	....	....	....	....	....	0.75	42	1.30	125	1.00	71
9	....	....	....	....	....	....	0.80	47	1.30	125	0.90	57
10	....	....	....	....	....	....	0.90	57	1.40	150	0.90	57
11	....	....	....	....	....	....	1.00	71	1.40	150	0.80	47
12	....	....	....	....	....	....	1.10	87	1.50	180	0.70	38
13	....	....	....	....	....	....	1.10	87	1.50	180	0.60	31
14	....	....	....	....	....	....	1.10	87	1.60	210	0.50	24
15	....	....	....	....	....	....	1.20	105	1.60	210	0.50	24
16	....	....	....	....	....	....	1.30	125	1.70	245	0.60	31
17	....	....	....	....	....	....	1.35	140	1.90	335	0.80	47
18	....	....	....	....	....	....	1.40	150	2.00	390	0.90	57
19	....	....	....	....	....	....	1.40	150	2.10	445	1.00	71
20	....	....	....	....	....	....	1.40	150	2.40	640	1.00	71
21	....	....	....	....	....	....	1.35	140	3.00	1,050	1.10	87
22	....	....	....	....	0.20	11.0	1.35	140	3.00	1,050	1.20	105
23	....	....	....	....	0.20	11.0	1.30	125	2.60	780	1.30	125
24	....	....	....	....	0.20	11.0	1.25	115	1.70	245	1.50	180
25	....	....	....	....	0.25	13.0	1.20	105	1.60	210	1.90	335
26	....	....	....	....	0.30	15.0	1.20	105	1.60	210	3.50	1,400
27	....	....	....	....	0.40	19.5	1.20	105	1.50	180	3.60	1,470
28	....	....	....	....	0.45	22.0	1.20	105	1.50	180	3.60	1,470
29	....	....	....	....	0.45	22.0	1.20	105	1.40	150	3.40	1,340
30	....	....	....	....	0.50	24.0	1.20	105	1.40	150	3.00	1,050
31	....	....	....	....	0.50	24.0	....	....	1.40	150	....	....

	July.		August.		September.		October.		November.		December.	
1	2.70	850	2.20	500	0.10	8.5	....	....	....	....	....	....
2	2.50	700	2.10	445	0.10	8.5	....	....	....	....	....	....
3	2.10	445	2.00	390	0.10	8.5	....	....	....	....	....	....
4	1.90	335	1.90	335	0.10	8.5	....	....	....	....	....	....
5	1.80	285	1.70	245	0.10	8.5	....	....	....	....	....	....
6	1.60	210	1.60	210	0.00	7.0	....	....	....	....	....	....
7	1.50	180	1.50	180	0.00	7.0	....	....	....	....	....	....
8	1.30	125	1.40	150	0.00	7.0	....	....	....	....	....	....
9	1.10	87	1.20	105	0.00	7.0	....	....	....	....	....	....
10	1.00	71	1.10	87	0.00	7.0	....	....	....	....	....	....
11	0.90	57	1.00	71	0.00	7.0	....	....	....	....	....	....
12	0.80	47	0.90	57	0.20	11.0	....	....	....	....	....	....
13	0.70	38	0.60	30	0.40	19.5	....	....	....	....	....	....
14	1.30	125	0.40	19	0.20	11.0	....	....	....	....	....	....
15	1.40	150	0.30	15	0.50	25.0	....	....	....	....	....	....
16	1.50	180	0.30	15	0.40	19.5	....	....	....	....	....	....
17	1.90	335	0.20	11	0.40	19.5	....	....	....	....	....	....
18	1.80	285	0.10	8	0.35	17.0	....	....	....	....	....	....
19	1.70	245	0.90	57	0.25	13.0	....	....	....	....	....	....
20	1.70	245	0.70	38	0.25	13.0	....	....	....	....	....	....
21	1.60	210	0.50	25	0.20	11.0	....	....	....	....	....	....
22	1.30	125	0.40	19	0.20	11.0	....	....	....	....	....	....
23	1.20	105	0.30	15	0.20	11.0	....	....	....	....	....	....
24	1.20	105	0.30	15	0.20	11.0	....	....	....	....	....	....
25	1.20	105	0.30	15	0.20	11.0	....	....	....	....	....	....
26	1.30	125	0.20	11	0.20	11.0	....	....	....	....	....	....
27	1.50	180	0.20	11	0.20	11.0	....	....	....	....	....	....
28	1.70	245	0.10	8	0.20	11.0	....	....	....	....	....	....
29	1.90	335	0.10	8	0.20	11.0	....	....	....	....	....	....
30	2.00	390	0.00	7	0.30	15.0	....	....	....	....	....	....
31	2.30	570	0.00	7	....	....	....	....	....	....	....	....

Monthly Discharge of Criss Creek near Mouth for 1915.

(Drainage area, 150 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	150	30	89	0.59	0.66	5,300
May	1,050	105	274	1.82	2.10	16,850
June	1,470	24	299	2.00	2.23	17,800
July	850	38	242	1.61	1.86	14,880
August	500	7	100	0.67	0.77	6,150
September	25	7	12	0.08	0.09	690
The period	1,470	7	169	1.13	7.71	61,670

DEADMAN RIVER.—(2008).

Location.—Section 15, township 22, range 22, west 6th meridian.

Records Available.—April 22 to November 21, 1913; April 1 to December 9, 1914; March 22 to December 30, 1915.

Drainage Area.—Three hundred square miles.

Gauge.—Standard vertical staff gauge read daily by J. Hoey.

Channel.—Channel is straight and control is good. Velocity is high only at high water.

Discharge Measurements.—Eleven measurements made during 1913-14-15 agree fairly well and cover the whole range of stage up to 450 cubic feet per second.

Winter Flow.—Ice conditions exist on this river during January, February and March.

Accuracy.—"B" and "C." Results very reliable except for the flood discharges on July 1-3, 1915.

Discharge Measurements of Deadman River above Criss Creek.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
April 22	Cline & Chisholm	1,055	40	73	3.5	3.52	256
April 23	Cline & Chisholm	1,055	30	92	3.1	3.60	281
May 17	K. G. Chisholm	1,055	34	115	4.1	3.95	410
June 11	K. G. Chisholm	1,055	24	33	3.0	2.38	99
Aug. 15	K. G. Chisholm	1,055	15	19	2.5	1.80	49
Oct. 6	K. G. Chisholm	1,055	12	9	1.1	0.93	10
1914							
May 24	C. B. Corbould	1,673	32	83	3.4	3.40	278
July 10	C. B. Corbould	1,915	24	30	1.4	1.60	43
1915							
April 1	F. R. Richardson	1,673	21	7	1.0	0.76	7
April 28	F. R. Richardson	1,673	11	10	1.4	1.10	14
Aug. 26	A. L. McNaughton	1,915	21	21	1.7	1.46	35

Daily Gauge Height and Discharge of Deadman River above Criss Creek for 1915.

(Drainage area, 300 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	0.75	3.0	1.10	18.0	2.45	105
2	......	......	......	......	......	......	0.80	5.0	1.05	15.5	2.35	94
3	......	......	......	......	......	......	0.85	7.0	1.05	15.5	2.35	94
4	......	......	......	......	......	......	0.95	11.0	1.00	13.0	2.35	94
5	......	......	......	......	......	......	0.95	11.0	1.00	13.0	2.25	85
6	......	......	......	......	......	......	1.00	13.0	1.00	13.0	2.15	77
7	......	......	......	......	......	......	1.00	13.0	1.00	13.0	2.15	77
8	......	......	......	......	......	......	1.00	13.0	1.00	13.0	2.05	69
9	......	......	......	......	......	......	0.95	11.0	0.95	11.0	2.05	69
10	......	......	......	......	......	......	0.90	9.0	0.95	11.0	2.05	69
11	......	......	......	......	......	......	0.90	9.0	1.00	13.0	1.95	62
12	......	......	......	......	......	......	0.95	11.0	1.00	13.0	1.85	56
13	......	......	......	......	......	......	0.95	11.0	1.00	13.0	1.85	56
14	......	......	......	......	......	......	0.95	11.0	1.05	15.5	1.85	56
15	......	......	......	......	......	......	1.05	15.5	1.05	15.5	1.85	56
16	......	......	......	......	......	......	1.05	15.5	1.05	15.5	1.85	56
17	......	......	......	......	......	......	1.05	15.5	1.05	15.5	1.85	56
18	......	......	......	......	......	......	1.15	20.0	1.05	15.5	1.85	56
19	......	......	......	......	......	......	1.10	18.0	1.25	25.0	1.95	62
20	......	......	......	......	......	......	1.15	20.0	1.45	35.0	1.95	62
21	......	......	......	......	......	......	1.25	25.0	1.65	45.0	1.95	62
22	......	......	......	......	0.70	1.0	1.25	25.0	1.75	50.0	2.15	77
23	......	......	......	......	0.70	1.0	1.15	20.0	1.70	48.0	2.35	94
24	......	......	......	......	0.70	1.0	1.15	20.0	1.95	62.0	2.45	105
25	......	......	......	......	0.70	1.0	1.10	18.0	2.45	105.0	2.45	105
26	......	......	......	......	0.70	1.0	1.05	15.5	2.70	135.0	2.65	130
27	......	......	......	......	0.75	3.0	1.05	15.5	2.75	140.0	2.65	130
28	......	......	......	......	0.75	3.0	1.05	15.5	2.75	140.0	2.95	170
29	......	......	......	......	0.75	3.0	1.05	15.5	2.75	140.0	3.20	205
30	......	......	......	......	0.75	3.0	1.05	15.5	2.65	130.0	3.75	335
31	......	......	......	......	0.75	3.0	......	......	2.55	115.0	......	......

	July.		August.		September.		October.		November.		December.	
1	4.15	500	2.85	155	1.25	25						
2	4.65	730	2.75	140	1.25	25						
3	4.35	590	2.75	130	1.25	20						
4	3.95	410	2.65	130	1.15	20						
5	3.25	215	2.55	115	1.15	20						
6	2.95	170	2.45	105	1.30	27						
7	2.95	170	2.35	95	1.35	30						
8	2.75	140	2.35	95	1.30	27						
9	2.55	115	2.25	85	1.30	27						
10	2.55	115	2.05	70	1.30	27						
11	2.45	105	1.95	63	1.25	25						
12	2.25	85	1.85	56	1.25	25						
13	2.25	85	1.85	56	1.25	25						
14	2.40	100	1.85	56	1.25	25						
15	2.45	105	1.75	50	1.25	25						
16	2.55	115	1.65	45	1.25	25						
17	2.75	140	1.65	45	1.25	25						
18	3.10	190	1.55	40	1.25	25						
19	3.30	225	1.55	40	1.25	25						
20	3.25	215	1.45	35	1.25	25						
21	3.25	215	1.45	35	1.25	25						
22	3.05	185	1.45	35	1.25	25						
23	2.95	170	1.45	35	1.25	25						
24	2.75	140	1.45	35	1.20	23						
25	2.65	130	1.45	35	1.25	25						
26	2.65	115	1.45	35	1.25	25						
27	2.55	115	1.35	30	1.25	25						
28	2.55	115	1.35	30	1.25	25						
20	2.70	135	1.35	30	1.20	23						
30	2.75	140	1.25	25	1.25	25						
31	2.75	140	1.25	25								

Monthly Discharge of Deadman River above Criss Creek for 1915.
(Drainage area, 300 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	25	3	14.2	0.05	0.05	845
May	140	11	46.0	0.15	0.17	2,830
June	335	56	94.1	0.31	0.35	5,600
July	730	85	197.0	0.66	0.76	12,110
August	155	25	63.4	0.21	0.24	3,900
September	30	20	24.8	0.08	0.09	1,476
The period	730	3	73.2	0.24	1.66	26,761

NOTE.—Regulated by storage dam on Deadman lake.

HAT CREEK, ABOVE HAMMOND'S DIVERSION.—(2016).

Location.—Section 18, township 19, range 26, west 6th meridian. At Colley's ranch, just above the Hammond diversion.

Records Available.—April 22, 1911, to December 31, 1911; January 1, 1912; to November 18, 1912; April 30 to December 31, 1913; April 1 to November 30, 1914; March 13 to September 30, 1915.

Drainage Area.—Forty-seven square miles.

Gauge.—Standard vertical gauge read daily by Thos. King.

Channel.—The channel is 12 to 14 feet in width and is straight above and below the gauge; the control is good.

Discharge Measurements.—Well-distributed meterings have been obtained covering the stream's range. Meterings were mostly made in the box flume above the Hammond diversion weir.

Winter Flow.—Stream is sometimes open during winter months.

Accuracy.—"A" and "B." Results should be very reliable at all stages.

Discharge Measurements of Hat Creek above Hammond's Diversion.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
April 28	E. M. Dann	268	10	5.2	0.9	0.16	4.7
May 2	E. M. Dann	268	11	8.3	1.5	0.39	13.0
May 29	E. M. Dann	268	....	....	....	0.97	43.5
May 30	E. M. Dann	268	....	....	....	1.57	75.1
May 31	E. M. Dann	268	....	....	....	1.41	92.6
July 18	C. G. Cline	1,046	11	5.0	1.0	0.16	4.8
Sept. 30	C. G. Cline	1,046	11	4.8	0.7	0.15	3.6
1912							
May 14	C. G. Cline	1,046	17	21.7	4.0	1.40	87.0
June 17	B. Corbould	1,046	12	7.5	1.6	0.38	12.0
July 11	B. Corbould	1,044	12	8.4	1.9	0.42	15.9
July 31	B. Corbould	1,044	12	5.4	1.0	0.23	5.3
Aug. 19	B. Corbould	1,044	12	6.4	1.4	0.30	9.4
1913							
April 28	Cline & Chisholm	1,055	11	5.4	1.2	0.25	6.2
Aug. 3	K. G. Chisholm	1,055	9	5.2	1.0	0.24	5.4
1915							
Mar. 12	F. R. Archibald	1,673	12	2.8	0.4	0.07	1.1
April 22	F. R. Archibald	1,673	16	11.3	1.8	0.58	19.9
Aug. 23	A. L. McNaughton	1,915	10	4.9	1.0	0.15	4.8

Daily Gauge Height and Discharge of Hat Creek above Hammond's Diversion for 1915.

(Drainage area, 47 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	0.15	4.0	0.52	18.0	0.80	32.0
2	......	......	......	......	......	......	0.14	3.7	0.52	18.0	0.72	28.0
3	......	......	......	......	......	......	0.30	8.5	0.55	19.5	0.70	27.0
4	......	......	......	......	......	......	0.32	9.3	0.67	25.0	0.67	25.0
5	......	......	......	......	......	......	0.30	8.5	0.80	32.0	0.70	27.0
6	......	......	......	......	......	......	0.30	8.5	0.85	35.0	0.62	23.0
7	......	......	......	......	......	......	0.30	8.5	0.95	42.0	0.60	22.0
8	......	......	......	......	......	......	0.35	10.5	1.00	45.0	0.60	22.0
9	......	......	......	......	......	......	0.30	8.5	0.90	38.0	0.67	25.0
10	......	......	......	......	......	......	0.38	11.7	0.90	38.0	0.72	28.0
11	......	......	......	......	......	......	0.38	11.7	0.85	35.9	0.75	28.0
12	......	......	......	......	......	......	0.35	10.5	0.70	27.0	0.70	27.0
13	......	......	......	......	0.02	0.5	0.38	11.7	0.65	24.0	0.70	27.0
14	......	......	......	......	0.05	1.2	0.45	14.7	0.90	38.0	0.67	25.0
15	......	......	......	......	0.10	2.5	0.57	20.0	0.90	38.0	0.65	24.0
16	......	......	......	......	0.08	2.0	0.80	32.0	0.77	30.0	0.70	27.0
17	......	......	......	......	0.10	2.5	0.95	42.0	0.82	34.0	0.70	27.0
18	......	......	......	......	0.08	2.0	0.85	35.0	0.90	38.0	0.65	24.0
19	......	......	......	......	0.10	2.5	0.80	32.0	1.25	67.0	0.62	23.0
20	......	......	......	......	0.08	2.0	0.70	27.0	1.20	61.0	0.55	19.0
21	......	......	......	......	0.10	2.5	0.70	27.0	1.15	57.0	0.52	18.0
22	......	......	......	......	0.08	2.0	0.60	22.0	1.10	52.0	0.50	17.0
23	......	......	......	......	0.10	2.5	0.70	27.0	1.00	45.0	0.50	17.0
24	......	......	......	......	0.06	1.5	0.65	24.0	0.92	40.0	0.50	17.0
25	......	......	......	......	0.08	2.0	0.62	23.0	0.90	38.0	0.48	16.1
26	......	......	......	......	0.10	2.5	0.60	22.0	0.80	32.0	0.48	16.1
27	......	......	......	......	0.10	2.5	0.60	22.0	0.80	32.0	0.49	16.6
28	......	......	......	......	0.09	2.2	0.54	19.0	0.80	32.0	0.48	16.1
29	......	......	......	......	0.10	2.5	0.60	22.0	0.80	32.0	0.42	13.4
30	......	......	......	......	0.08	2.0	0.59	21.0	0.80	32.0	0.40	12.5
31	......	......	......	......	0.12	3.1	......	......	0.80	32.0	......	......

	July.		August.		September.		October.		November.		December.	
1	0.40	12.5	0.40	12.5	0.12	3.1	......	......	......	......	......	......
2	0.40	12.5	0.30	8.5	0.12	3.1	......	......	......	......	......	......
3	0.40	12.5	0.25	7.0	0.10	2.5	......	......	......	......	......	......
4	0.47	15.6	0.22	6.1	0.10	2.5	......	......	......	......	......	......
5	0.59	12.1	0.22	6.1	0.10	2.5	......	......	......	......	......	......
6	0.38	11.7	0.25	7.0	0.10	2.5	......	......	......	......	......	......
7	0.37	11.3	0.25	7.0	0.10	2.5	......	......	......	......	......	......
8	0.35	10.5	0.25	7.0	0.10	2.5	......	......	......	......	......	......
9	0.31	8.9	0.22	6.1	0.12	3.0	......	......	......	......	......	......
10	0.30	8.5	0.20	5.5	0.10	2.5	......	......	......	......	......	......
11	0.30	8.5	0.20	5.5	0.08	2.0	......	......	......	......	......	......
12	0.30	8.5	0.20	5.5	0.05	1.4	......	......	......	......	......	......
13	0.30	8.5	0.20	5.5	0.05	1.4	......	......	......	......	......	......
14	0.32	9.3	0.20	5.5	0.05	1.4	......	......	......	......	......	......
15	0.37	11.3	0.18	4.9	0.05	1.4	......	......	......	......	......	......
16	0.35	10.5	0.18	4.9	0.05	1.4	......	......	......	......	......	......
17	0.37	11.3	0.20	5.5	0.03	0.9	......	......	......	......	......	......
18	0.35	10.5	0.25	7.0	0.03	0.9	......	......	......	......	......	......
19	0.30	8.5	0.30	8.5	0.05	1.4	......	......	......	......	......	......
20	0.30	8.5	0.30	8.5	0.10	2.5	......	......	......	......	......	......
21	0.30	8.5	0.30	8.5	0.10	2.5	......	......	......	......	......	......
22	0.28	7.9	0.25	7.0	0.10	2.5	......	......	......	......	......	......
23	0.25	7.0	0.20	5.5	0.10	2.5	......	......	......	......	......	......
24	0.22	6.1	0.18	4.9	0.10	2.5	......	......	......	......	......	......
25	0.22	6.1	0.15	4.0	0.10	2.5	......	......	......	......	......	......
26	0.28	7.9	0.15	4.0	0.10	2.5	......	......	......	......	......	......
27	0.27	7.6	0.12	3.1	0.10	2.5	......	......	......	......	......	......
28	0.35	10.5	0.12	3.1	0.10	2.5	......	......	......	......	......	......
29	0.40	12.5	0.12	3.1	0.10	2.5	......	......	......	......	......	......
30	0.37	11.3	0.12	3.1	0.10	2.5	......	......	......	......	......	......
31	0.35	10.5	0.12	3.1	......	......	......	......	......	......	......	......

Monthly Discharge of Hat Creek above Hammond's Diversion for 1915.

(Drainage area, 47 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	42.0	3.7	18.2	0.39	0.43	1,083
May	67.0	18.0	36.3	0.77	0.89	2,232
June	32.0	12.5	22.3	0.47	0.52	1,327
July	15.6	6.1	9.9	0.21	0.24	609
August	12.5	3.1	5.9	0.13	0.15	363
September	3.1	0.9	2.2	0.05	0.05	131
The period	67.0	0.9	17.4	0.33	2.28	5,745

NAHATLATCH RIVER, SEVEN MILES FROM MOUTH.—(2027).

Location.—Section 7, township 12, range 26, west 6th meridian.

Records Available.—March 1 to December 7, 1912; January 1 to December 31, 1913; January 1 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—Four hundred square miles.

Gauge.—Standard vertical staff gauge read weekly by Chas. Nicholson.

Channel.—Channel at section is straight, with an average depth at low water of 8 feet. Bed of river rocky and permanent.

Discharge Measurements.—Discharge measurements are made from cable car. Six measurements made during 1912-13-14 agree very well and cover the whole range of stage.

Winter Flow.—Open conditions prevailed throughout the winter.

Accuracy.—Results are quite reliable except for the fact that the gauge readings are only taken once a week.

Discharge Measurements of Nahatlatch River 7 Miles from Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
July 23	C. G. Cline	1,046	80	432	4.44	3.75	1,920
Nov. 28	C. G. Cline	1,048	70	352	2.53	2.20	890
1913							
June 26	Cline & Chisholm	1,044	95	747	6.47	6.40	4,640
July 4	K. G. Chisholm	1,055	93	627	5.09	4.95	3,200
Sept. 21	K. G. Chisholm	1,055	80	431	2.96	2.63	1,270
1915							
Feb. 15	E. H. Tredcroft	1,923	70	262	1.10	3.40	290

Daily Gauge Height and Discharge of Nahatlatch River 7 Miles from Mouth for 1915.

(Drainage area, 400 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	......	......	......	......	......	......	......
2	1.30	570	......	......	......	......	......	......	3.50	1,800	......	......
3	......	......	......	......	......	......	......	......	......	......	......	......
4	......	......	......	......	......	......	6.15	4,360	......	......	......	......
5	......	......	......	......	......	......	......	......	......	......	......	......
6	......	......	......	......	......	......	......	......	......	......	6.50	4,750
7	......	......	0.70	390	0.95	465	......	......	......	......	......	......
8	......	......	......	......	......	......	......	......	......	......	......	......
9	......	......	......	......	......	......	......	......	7.20	5,480	......	......
10	1.10	510	......	......	......	......	......	......	......	......	......	......
11	......	......	......	......	......	......	3.75	2,000	......	......	......	......
12	......	......	......	......	......	......	......	......	......	......	......	......
13	......	......	......	......	......	......	......	......	......	......	5.00	3,160
14	......	......	......	......	1.05	495	......	......	......	......	......	......
15	......	......	0.75	405	......	......	......	......	......	......	......	......
16	......	......	......	......	......	......	......	......	4.25	2,450	......	......
17	0.90	450	......	......	......	......	5.50	3,660	......	......	......	......
18	......	......	......	......	......	......	......	......	......	......	......	......
19	......	......	......	......	......	......	......	......	......	......	......	......
20	......	......	......	......	......	......	......	......	......	......	4.20	2,410
21	......	......	0.70	390	1.45	630	......	......	......	......	......	......
22	......	......	......	......	......	......	......	......	......	......	......	......
23	0.70	390	......	......	......	......	......	......	4.80	2,960	......	......
24	......	......	......	......	......	......	4.50	2,680	......	......	......	......
25	......	......	......	......	......	......	......	......	......	......	......	......
26	......	......	......	......	......	......	......	......	......	......	......	......
27	......	......	......	......	......	......	......	......	......	......	3.95	2,180
28	......	......	0.80	420	2.55	1,150	......	......	......	......	......	......
29	......	......	......	......	......	......	......	......	......	......	......	......
30	0.65	380	......	......	......	......	......	......	4.45	2,630	......	......
31	......	......	......	......	......	......	......	......	......	......	......	......

Day.	July.		August.		September.		October.		November.		December.	
1	......	......	4.20	2,410	......	......	......	......	......	......	......	......
2	......	......	......	......	......	......	......	......	......	......	......	......
3	......	......	......	......	......	......	1.95	850	......	......	......	......
4	3.80	3,980	......	......	......	......	......	......	......	......	......	......
5	......	......	......	......	2.75	1,270	......	......	......	......	1.50	650
6	......	......	......	......	......	......	......	......	......	......	......	......
7	......	......	......	......	......	......	......	......	3.35	1,680	......	......
8	......	......	3.20	1,560	......	......	......	......	......	......	......	......
9	......	......	......	......	......	......	......	......	......	......	......	......
10	......	......	......	......	......	......	0.90	450	......	......	......	......
11	3.70	1,960	......	......	......	......	......	......	......	......	......	......
12	......	......	......	......	1.50	650	......	......	......	......	1.30	570
13	......	......	......	......	......	......	......	......	......	......	......	......
14	......	......	......	......	......	......	......	......	1.55	670	......	......
15	......	......	3.35	1,680	......	......	......	......	......	......	......	......
16	......	......	......	......	......	......	......	......	......	......	......	......
17	......	......	......	......	......	......	1.00	480	......	......	......	......
18	3.30	1,640	......	......	......	......	......	......	......	......	......	......
19	......	......	......	......	1.60	690	......	......	......	......	1.00	480
20	......	......	......	......	......	......	......	......	......	......	......	......
21	......	......	......	......	......	......	......	......	1.70	730	......	......
22	......	......	3.90	2,140	......	......	......	......	......	......	......	......
23	......	......	......	......	......	......	......	......	......	......	......	......
24	......	......	......	......	......	......	3.45	1,760	......	......	......	......
25	4.00	2,230	......	......	......	......	......	......	......	......	......	......
26	......	......	......	......	1.50	650	......	......	......	......	1.05	500
27	......	......	......	......	......	......	......	......	......	......	......	......
28	......	......	......	......	......	......	......	......	1.40	610	......	......
29	......	......	3.05	1,450	......	......	......	......	......	......	......	......
30	......	......	......	......	......	......	......	......	......	......	......	......
31	......	......	......	......	......	......	4.00	3,230	......	......	......	......

NICOLA RIVER, AT MOUTH.—(2030).

Location.—Section 12, township 17, range 25, west 6th meridian.

Records Available.—August 1 to November 31, 1911; April 5 to December 21, 1912; May 9 to December 11, 1913; April 1 to September 30, 1914; April 1 to September 30, 1915.

Drainage Area.—Two thousand six hundred and fifty square miles.

Gauge.—Incline staff gauge read three times a week by Miss Violet Curnow.

Channel.—Straight at measuring section. Velocity high. Bed of stream is composed of rocks and gravel. During high water on the Thompson river the control is affected at the measuring section but not at the gauge.

Nicola river, at mouth. Inclined staff gauge bolted to solid rock.

Discharge Measurements.—Are made from bridge at all stages. Eleven measurements made during 1912-13-14 agree fairly well and cover practically the whole range of stage.

Winter Flow.—Ice conditions exist usually during January, February and March.

Accuracy.—"C." Results should be fairly reliable at all stages, though no measurements have been made during 1915.

Discharge Measurements of Nicola River at Mouth.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
Mar. 29	C. G. Cline	1,046	105	127	1.9	2.00	242
May 3	C. E. Richardson	1,048	128	348	4.6	4.40	1,600
May 27	Cline & Corbould	1,046	140	658	6.1	6.60	3,990
July 3	C. B. Corbould	1,046	130	399	3.2	4.20	1,298
July 20	C. B. Corbould	1,046	120	260	2.6	3.10	667
Aug. 10	C. B. Corbould	1,046	115	167	1.9	2.25	321
1913							
May 9	K. G. Chisholm	1,044	130	490	5.4	5.49	2,586
June 7	K. G. Chisholm	1,055	150	778	5.3	6.65	4,159
Aug. 12	K. G. Chisholm	1,055	113	194	2.1	2.50	410
1914							
May 23	K. G. Chisholm	1,055	144	873	8.1	7.60	6,456
July 31	C. B. Corbould	1,915	115	197	2.4	2.42	468

Daily Gauge Height and Discharge of Nicola River near Mouth for 1915.

(Drainage area, 2,650 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		1,700	4.40	1,600	4.80	1,920	3.80	1,160	3.05	720		210
2	4.50	1,680		1,630		1,940		1,140		680	1.65	205
3		1,660		1,660	4.85	1,960	3.75	1,120		640		200
4		1,640	4.50	1,680		1,990		1,080	2.80	590	1.60	195
5		1,620		1,900	4.90	2,010		1,040		570		205
6	4.40	1,600	5.00	2,110		1,920	3.55	1,000		550		215
7		1,620		2,560		1,840		950	2.65	530	1.75	230
8	4.45	1,640	5.80	3,010	4.60	1,760	3.40	910		490		225
9		1,520		2,680		1,680		860		460	1.70	220
10	4.15	1,400		2,350	4.40	1,600	3.20	800	2.40	430		220
11		1,570	4.90	2,010		1,560		730		390	1.70	220
12		1,740		1,850	4.30	1,520	2.95	660		360		215
13	4.80	1,920	4.50	1,680		1,550		710	2.10	330		210
14		1,880		1,760		1,580	3.15	770		290	1.65	205
15	4.70	1,840	4.70	1,840	4.40	1,600		785	1.85	255		200
16		2,230		1,840		1,560	3.20	800		275	1.60	195
17	5.50	2,620		1,840	4.30	1,520		800	2.00	300		195
18		2,850	4.70	1,840		1,440		800		315	1.60	195
19		3,080		2,360	4.10	1,370		800	2.10	330		210
20	6.00	3,300	5.70	2,880		1,320	3.20	800		330	1.70	220
21		2,870		2,750		1,270		800	2.00	300		225
22		2,440	5.50	2,620	3.90	1,230	3.20	800		290	1.75	230
23	4.90	2,010		2,660		1,190		790		280		220
24	4.80	1,920		2,700	3.80	1,160		780	1.90	270		220
25		1,890	5.60	2,750		1,110	3.15	770		255		220
26		1,860		2,480	3.65	1,060		760	1.80	245		220
27		1,830	5.10	2,210		1,090		750		240		220
28	4.65	1,800		2,310		1,120	3.10	750	1.75	230		220
29	4.80	1,920	5.30	2,410	3.80	1,160		730		225		220
30		1,760		2,170		1,160	3.05	720		220		220
31				2,040				720		215		

Day.	October.		November.		December.	
1						
2						
3						
4			3.00	690		
5						
6						
7			2.20	360		
8						
9						
10						
11			1.70	220		
12						
13						
14	1.70	220				
15		220	1.70	220		
16	1.70	220				
17	1.70	220				
18		220				
19	1.70	220				
20		250				
21	1.95	285				
22		285				
23	1.95	285				
24		350				
25	2.35	415				
26		675				
27	3.45	940				
28	4.70	1,840				
29		1,500				
30	3.80	1,160				
31						

Monthly Discharge of Nicola River at Mouth for 1915.

(Drainage area, 2,650 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	3,300	1,400	1,980	0.75	0.84	118,000
May	3,010	1,600	2,200	0.83	0.96	135,000
June	2,010	1,060	1,505	0.57	0.64	89,500
July	1,160	660	841	0.32	0.37	51,700
August	720	215	374	0.14	0.16	23,000
September	230	195	213	0.08	0.09	12,700
The period	3,300	195	1,185	0.45	3.06	429,900

NICOLA RIVER, AT MERRITT.—(2029).

Location.—At Merritt; Water District No. 3.

Records Available.—June 16 to December 31, 1911; January 31 to December 31, 1912; January 1 to December 31, 1913; January 1 to December 31, 1914; April 1 to December 31, 1915.

Drainage Area.—One thousand five hundred square miles.

Gauge.—Standard vertical staff gauge read tri-weekly by Miss C. A. Seaton.

Channel.—The bed of the stream is gravelly and the flow is in two channels during high water. The channel seems to be shifting considerably.

Discharge Measurements.—Between discharges of 200 and 1,200 cubic feet per second, the rating curve has been located by four measurements made during 1915. For lower discharges a comparison was made with the station on the Nicola river, near Nicola lake, and on the Coldwater river. For higher discharges, the 1914 measurements were used.

Winter Flow.—Open conditions usually prevail most of the winter.

Accuracy.—"C." The accuracy is somewhat impaired by the shifting of the channel and also by the fact that the gauge readings are not taken every day.

Discharge Measurements of Nicola River at Merritt.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 3	K. G. Chisholm	1,505	160	537	4.65	7.53	2,500
May 25	K. G. Chisholm	1,055	150	649	4.51	7.80	2,926
1915							
Feb. 9	E. H. Tredcroft	1,923	51	194	0.40	4.40	74[1]
May 5	E. M. Dann	1,055	58	233	3.27	5.86	760
June 2	E. H. Tredcroft	1,923	86	299	3.40	6.30	1,020
June 8	A. L. McNaughton	1,915	59	265	3.52	6.19	943
July 24	A. L. McNaughton	1,915	56	190	1.50	5.00	284

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[1] Partial ice conditions.

Daily Gauge Height and Discharge of Nicola River near Merritt for 1915.

(Drainage area, 1,500 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	380	......	660	6.35	1,110	5.65	620	......	275	4.20	70
2	5.30	425	5.70	650	......	1,080	......	630	4.95	265	......	70
3	......	535	......	680	6.30	1,060	5.70	650	......	255	4.20	70
4	5.70	650	5.80	710	......	1,060	......	600	4.90	245	......	67
5	......	710	......	740	6.30	1,060	5.55	560	......	240	4.15	65
6	5.90	770	5.90	770	......	1,040	......	515	4.85	230	......	65
7	......	710	......	850	6.25	1,020	5.40	475	......	220	4.15	65
8	5.70	650	6.15	940	......	1,000	......	450	4.80	210	4.20	70
9	......	590	6.10	910	6.20	980	5.30	425	......	200	4.15	65
10	5.50	530	6.05	870	......	960	......	400	4.75	195	......	62
11	......	620	......	820	6.15	940	5.20	375	......	180	4.10	60
12	5.80	710	5.90	770	......	930	......	375	4.65	170	......	57
13	5.90	770	......	800	6.10	910	5.20	375	......	155	4.05	55
14	5.80	710	6.00	840	......	870	......	375	4.55	140	......	55
15	......	740	......	770	6.00	840	5.20	375	......	140	4.05	55
16	5.90	770	5.80	710	......	820	......	375	4.55	140	......	52
17	......	910	......	770	5.95	800	5.20	375	......	140	4.00	50
18	6.30	1,060	6.00	840	......	790	......	360	4.55	140	......	50
19	......	980	......	1,000	5.90	770	5.15	350	......	135	4.00	50
20	6.10	910	6.40	1,160	......	740	......	340	4.50	130	......	50
21	......	870	......	1,140	5.80	710	5.10	330	......	125	4.00	50
22	6.00	840	6.35	1,110	......	690	......	320	4.45	120	......	48
23	5.90	770	......	1,080	5.75	680	5.05	305	......	110	3.95	46
24	5.80	710	6.30	1,060	......	670	......	295	4.40	105	......	46
25	......	710	......	1,110	5.70	650	5.00	285	......	95	3.95	46
26	5.80	710	6.40	1,160	......	650	......	275	4.30	85	......	44
27	......	710	......	1,210	5.70	650	4.95	265	......	85	3.90	42
28	5.80	710	6.50	1,260	......	650	......	275	4.30	85	......	42
29	......	700	......	1,210	5.70	650	5.00	285	......	80	3.90	42
30	5.75	680	6.40	1,160	......	630	......	285	4.25	75	......	42
31	......	......	......	1,130	......	......	5.00	285	......	70	......	......

Monthly Discharge of Nicola River near Merritt for 1915.

(Drainage area, 1,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,060	380	685	0.46	0.51	40,800
May	1,260	650	932	0.62	0.71	57,300
June	1,110	630	847	0.56	0.63	50,400
July	650	265	394	0.26	0.30	24,200
August	275	70	156	0.10	0.12	9,590
September	70	42	55	0.04	0.04	3,270
The period	1,260	42	511	0.34	2.31	185,560

NICOLA RIVER, AT NICOLA.—(2075).

Location.—At Nicola; Water District No. 2.

Records Available.—April 14 to August 31, 1913; February 22 to December 31, 1915.

Drainage Area.—One thousand three hundred square miles.

Gauge.—Vertical staff read daily by V. H. Harbord.

Channel.—Rocky; permanent control; high banks.

Discharge Measurements.—Ten measurements made by the Provincial Water Rights Branch in 1913, and five measurements made by the B.C. Hydrometric Survey in 1915 agree very well and cover practically the whole range of stage for 1915, and all but the peak of the freshet for 1913.

Winter Flow.—Partial ice conditions in January.

Accuracy.—"B" and "C." Results should be very reliable except for discharges above 700 cubic feet per second.

Co-operation.—This station was established April 11, 1913, by A. G. Woolsey, of the Provincial Water Rights Branch, and the gauge readings and meter measurements for 1913 were taken under his direction. The station was taken over by the B.C. Hydrometric Survey, February 10, 1915.

Discharge Measurements of Nicola River at Nicola.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
April 14	A. G. Woolsey		41	49	0.94	0.42	46
April 14	A. G. Woolsey		41	49	0.86	0.43	42
April 16	A. G. Woolsey		41	44	0.95	0.40	42
April 19	A. G. Woolsey		45	48	0.96	0.50	46
April 24	A. G. Woolsey		43	56	1.14	0.60	64
April 28	A. G. Woolsey		45	62	1.61	0.80	100
May 1	A. G. Woolsey		45	58	1.30	0.72	75
May 3	A. G. Woolsey		47	69	1.67	0.90	115
May 13	A. G. Woolsey		46	79	2.10	1.10	166
May 20	A. G. Woolsey		50	103	3.13	1.70	322
1915							
Feb. 10	E. H. Tredcroft	1,923	29	28	0.45	-0.40	13
May 5	E. M. Dann	1,055	42	35	3.60	0.97	126
June 9	A. L. McNaughton	1,915	50	108	6.00	2.24	649
July 26	A. L. McNaughton	1,915	62	116	1.88	1.30	219
Dec. 18	McNaughton & Cline	1,915	32	29	0.80	0.20	22

NOTE.—The 1913 measurements were made for the Provincial Water Rights Branch.

Daily Gauge Height and Discharge of Nicola River at Nicola for 1915.

(Drainage area, 1,300 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	0.72	90	2.50	830	2.30	690	1.18	180	....	....
2	....	....	....	115	2.50	830	2.25	650	1.18	180	....	....
3	....	....	0.90	120	2.60	900	2.25	650	1.18	180	....	....
4	....	....	....	120	2.70	1,000	2.20	620	1.05	150	....	....
5	....	....	0.90	120	2.75	1,100	2.20	620	0.90	130	....	....
6	....	....	0.85	119	2.80	1,200	2.25	650	0.85	110	....	....
7	....	....	0.90	120	2.80	1,200	2.00	500	0.85	110	....	....
8	....	....	....	120	2.85	1,300	2.00	500	0.90	130	....	....
9	....	....	0.92	125	2.80	1,200	2.00	500	0.85	110	....	....
10	....	....	0.95	130	2.75	1,100	1.90	445	0.85	110	....	....
11	....	....	....	140	2.75	1,100	1.85	420	0.85	110	....	....
12	....	....	....	150	2.70	1,000	1.82	410	0.80	100	....	....
13	....	....	1.10	160	2.70	1,000	1.75	370	0.80	100	....	....
14	0.43	49	....	180	2.75	1,100	1.80	395	0.70	85	....	....
15	....	....	1.25	200	....	1,000	1.72	360	0.80	100	....	....
16	0.40	46	....	220	2.55	860	1.72	360	0.80	100	....	....
17	....	....	....	250	2.55	860	....	355	0.80	100	....	....
18	....	....	....	280	2.50	830	1.70	350	0.80	100	....	....
19	0.50	57	....	210	....	850	1.67	340	0.72	90	....	....
20	....	....	1.66	335	2.55	860	....	330	0.70	85	....	....
21	....	....	....	350	2.55	860	1.60	310	0.67	80	....	....
22	....	....	....	370	2.50	830	1.55	290	0.65	75	....	....
23	....	....	....	390	2.45	800	1.50	275	0.67	80	....	....
24	0.60	70	....	410	2.45	800	1.45	260	0.62	75	....	....
25	....	....	....	430	2.40	760	1.42	250	0.50	57	....	....
26	....	....	1.90	445	2.40	760	1.38	230	0.50	57	....	....
27	....	....	2.50	830	2.35	720	1.28	205	0.55	63	....	....
28	0.80	100	2.50	830	2.30	690	1.20	185	0.55	63	....	....
29	....	....	2.50	830	2.30	690	1.20	185	0.50	57	....	....
30	....	....	2.35	720	2.30	690	1.20	185	0.50	57	....	....
31	....	....	2.30	690	....	....	1.20	185	....	55	....	....

Monthly Discharge of Nicola River at Nicola for 1913.

(Drainage area, 1,300 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	830	90	321	0.24	0.28	19,700
June	1,300	690	924	0.71	0.79	55,000
July	690	185	390	0.30	0.35	24,000
August	180	55	100	0.08	0.09	6,100
The period	1,300	55	434	0.33	1.51	104,800

Daily Gauge Height and Discharge of Nicola River at Nicola for 1915.

(Drainage area, 1,300 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	......	......	......	......	30	0.30	37	0.87	115	2.37	740
2	......	......	......	......	......	30	0.30	37	0.92	125	2.42	770
3	......	......	......	......	......	30	0.30	37	0.93	125	2.38	740
4	......	......	......	......	0.20	30	0.35	41	0.95	130	2.43	780
5	......	......	......	......	......	30	0.40	46	0.96	130	2.42	770
6	......	......	......	......	0.22	31	0.39	45	0.98	135	2.42	770
7	......	......	......	......	......	31	0.35	41	0.97	135	2.38	740
8	......	......	......	......	......	31	0.30	37	0.99	140	2.35	720
9	......	......	......	......	0.22	31	0.30	37	1.02	145	2.24	650
10	......	......	......	......	......	32	0.39	45	1.04	150	2.21	630
11	......	......	......	......	......	32	0.36	42	1.17	175	2.19	610
12	......	......	......	......	......	32	0.42	48	1.17	175	2.15	590
13	......	......	......	......	0.24	33	0.38	44	1.19	180	2.11	560
14	......	......	......	......	......	34	0.49	56	1.21	185	2.05	530
15	......	......	......	......	......	35	0.48	55	1.33	220	2.01	500
16	......	......	......	......	......	36	0.45	51	1.35	225	1.98	490
17	......	......	......	......	0.30	37	0.48	55	1.42	245	1.95	470
18	......	......	......	......	......	37	0.52	59	1.45	255	1.94	460
19	......	......	......	......	0.30	37	0.48	55	1.51	280	1.91	450
20	......	......	......	......	......	38	0.62	73	1.60	310	1.86	420
21	......	......	......	......	0.32	39	0.65	77	1.62	320	1.78	385
22	......	......	0.12	25	......	38	0.55	63	1.74	370	1.78	385
23	......	......	......	......	0.30	37	0.48	55	1.88	435	1.75	370
24	......	......	......	......	......	36	0.72	88	1.95	470	1.72	360
25	......	......	0.12	25	......	36	0.63	74	1.98	490	1.70	350
26	......	......	......	......	......	36	0.65	77	2.15	590	1.69	345
27	......	......	......	......	......	36	0.70	85	2.25	650	1.68	340
28	......	......	......	......	0.28	36	0.72	88	2.43	780	1.68	340
29	......	......	......	......	......	36	0.82	105	2.47	810	1.68	340
30	......	......	......	......	......	36	0.80	100	2.45	800	1.68	340
31	......	......	......	......	......	36	......	......	2.43	780	......	......

	July.		August.		September.		October.		November.		December.	
1	1.68	340	1.25	195	0.60	70	0.18	29	0.08	23	0.11	24
2	1.68	340	1.25	195	0.58	67	0.20	30	0.06	22	0.12	25
3	1.68	340	1.21	185	0.55	63	0.20	30	0.08	23	0.11	24
4	1.68	340	1.18	180	0.54	62	0.20	30	0.07	22	0.12	25
5	1.66	335	1.15	170	0.54	62	0.25	33	0.10	24	0.12	25
6	1.62	320	1.14	170	0.52	59	0.25	33	0.07	22	0.12	25
7	1.55	290	1.12	165	0.50	57	0.25	33	0.13	26	0.13	26
8	1.50	275	1.08	155	0.49	56	0.25	33	0.07	22	0.13	26
9	1.42	245	1.08	155	0.48	54	0.18	29	0.10	24	0.14	26
10	1.42	245	1.06	150	0.48	54	0.15	27	0.13	26	0.15	27
11	1.43	250	1.05	150	0.49	56	0.10	24	0.14	26	0.15	27
12	1.46	260	1.02	145	0.46	52	0.10	24	0.10	24	0.16	28
13	1.46	260	1.00	140	0.42	48	0.09	24	0.10	24	0.16	28
14	1.46	260	0.98	135	0.38	44	0.09	24	0.10	24	0.16	28
15	1.27	200	0.97	135	0.33	40	0.15	27	0.10	24	0.16	28
16	1.43	250	0.96	130	0.30	37	0.18	29	0.10	24	0.16	28
17	1.44	255	0.95	130	0.26	34	0.00	20	0.09	24	0.16	28
18	1.40	240	0.93	125	0.25	33	0.11	24	0.10	24	0.16	28
19	1.39	235	0.91	120	0.25	33	0.15	27	0.09	24	......	28
20	1.33	220	0.86	110	0.25	33	0.10	24	0.09	24	0.16	28
21	1.30	210	0.81	100	0.25	33	0.10	24	0.08	23	0.16	28
22	1.27	200	0.78	97	0.25	33	0.19	29	0.09	24	0.16	28
23	1.25	195	0.76	94	0.23	32	0.00	20	0.09	24	0.16	28
24	1.28	205	0.75	92	0.22	31	0.16	28	0.08	23	0.17	28
25	1.30	210	0.73	90	0.21	30	0.13	26	0.09	24	0.17	28
26	1.31	210	0.73	90	0.20	30	0.15	27	0.08	23	0.18	29
27	1.30	210	0.70	85	0.20	30	0.17	28	0.08	23	0.18	29
28	1.27	200	0.67	80	0.19	29	0.01	20	0.09	24	0.19	29
29	1.25	195	0.65	77	0.18	28	0.13	26	0.10	24	0.19	29
30	1.26	200	0.63	74	0.18	28	0.12	25	0.12	25	0.19	29
31	1.27	200	0.60	70	......	......	0.12	25	......	......	0.20	30

Monthly Discharge of Nicola River at Nicola for 1915.

(Drainage area, 1,300 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	39	30	34	0.03	0.03	2,090
April	105	37	58	0.04	0.05	3,450
May	810	115	325	0.25	0.29	20,000
June	780	340	531	0.41	0.46	31,600
July	340	195	250	0.19	0.22	15,400
August	195	70	129	0.10	0.11	7,930
September	70	28	44	0.03	0.04	2,620
October	33	20	27	0.02	0.02	1,660
November	26	22	24	0.02	0.02	1,430
December	30	24	27	0.02	0.02	1,660
The period	810	20	145	0.11	1.26	87,840

NICOLA RIVER, ABOVE NICOLA LAKE.—(2086).

Location.—At highway bridge, six miles from Nicola Lake; Provincial Water District No. 3.

Records Available.—Records have been kept from May 12 to September 16, 1915, which will be available when the station is more completely rated.

Gauge.—Vertical staff read by W. M. Lauder.

Channel.—Rocks and gravel; stream confined between abutments of highway bridge.

Discharge Measurements.—Three measurements in 1915 under open water conditions and one under ice cover. More measurements are needed at high and low stages.

Accuracy.—The discharges computed should be quite reliable.

Discharge Measurements of Nicola River above Nicola Lake.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
May 6	E. M. Dann	1,055	37	86	2.7	1.70	227
June 10	A. L. McNaughton	1,915	36	101	3.1	1.95	313
July 27	A. L. McNaughton	1,915	40	45	2.6	1.20	117
Dec. 19	Cline & McNaughton	1,915	36	63	0.6	Ice	36

Daily Gauge Height and Discharge of Nicola River above Nicola Lake for 1915.

Day.	May.		June.		July.		August.		September.			
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	2.6	....	1.8	250	1.2	120	0.4	....	....	....
2	....	....	....	....	1.8	250	1.2	120	0.4	....	....	....
3	....	....	2.5	....	1.8	250	1.2	120	0.4	....	....	....
4	....	....	....	....	1.8	250	1.2	120	0.4	....	....	....
5	....	....	....	....	....	....	1.2	120	0.3	....	....	....
6	....	....	2.2	....	1.7	220	1.1	100	0.3	....	....	....
7	....	....	2.1	360	1.7	220	1.1	100	0.3	....	....	....
8	....	....	2.0	320	....	....	1.1	100	0.3	....	....	....
9	....	....	2.0	320	....	....	1.1	100	0.3	....	....	....
10	....	....	....	....	....	....	1.1	100	0.3	....	....	....
11	....	....	....	....	....	....	1.0	....	0.3	....	....	....
12	2.1	....	....	....	....	....	1.0	....	0.2	....	....	....
13	2.1	....	....	....	....	....	1.0	....	0.2	....	....	....
14	2.2	....	1.8	250	....	....	1.0	....	0.2	....	....	....
15	2.2	....	....	....	....	....	1.0	....	0.2	....	....	....
16	2.2	....	1.8	250	....	....	0.9	....	0.2	....	....	....
17	2.2	....	1.8	250	....	....	0.9	....	....	....	....	....
18	2.4	....	1.7	220	....	....	0.8	....	....	....	....	....
19	2.9	....	....	....	....	....	0.7	....	....	....	....	....
20	2.9	....	1.5	170	....	....	0.7	....	....	....	....	....
21	3.1	....	1.5	170	....	....	0.7	....	....	....	....	....
22	2.9	....	1.4	150	1.4	150	0.7	....	....	....	....	....
23	3.0	....	1.4	150	1.4	150	0.7	....	....	....	....	....
24	3.1	....	....	....	1.4	150	0.7	....	....	....	....	....
25	3.0	....	....	....	1.4	150	0.6	....	....	....	....	....
26	2.9	....	1.5	170	1.4	150	0.6	....	....	....	....	....
27	....	....	1.7	220	1.3	130	0.5	....	....	....	....	....
28	2.8	....	1.8	250	1.3	130	0.5	....	....	....	....	....
29	2.8	....	1.8	250	1.3	130	0.5	....	....	....	....	....
30	2.8	....	1.8	250	1.2	120	0.5	....	....	....	....	....
31	2.7	....	....	....	1.2	120	0.5	....	....	....	....	....

NOTE.—Station only partly rated during 1915.

SPIUS CREEK.—(2037).

Location.—Section 23, township 13, range 23, west of 6th meridian.

Records Available.—August 18 to November 22, 1911; May 8 to September 12, 1912; May 25 to November 30, 1913; March 22 to December 24, 1914; March 7 to October 15, 1915.

Drainage Area.—Three hundred and forty-four (344) square miles.

Gauge.—Standard chain gauge read daily by G. A. Longbotham.

Channel.—The channel is composed of rocks and boulders; velocity of water is high at all stages.

Discharge Measurements.—Six discharge measurements were obtained during 1914 at varying stages, and curve is fairly well defined. One ice measurement in 1915.

Winter Flow.—Ice conditions exist from November to February.

Accuracy.—"C." A high accuracy value cannot be assigned, since no measurements under open water conditions have been made during 1915.

Discharge Measurements of Spius Creek at Longbotham's Ranch.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
Mar. 18	K. G. Chisholm	1,505	70	111	1.73	1.48	191
May 5	K. G. Chisholm	1,505	91	234	5.51	3.04	1,309
May 6	K. G. Chisholm	1,505	90	224	5.16	2.92	1,171
May 27	K. G. Chisholm	1,055	108	240	5.11	3.00	1,236
July 10	K. G. Chisholm	1,913	76	138	3.60	2.08	499
July 30	C. B. Corbould	1,915	68	67	1.85	1.25	120
1915							
Feb. 12	E. H. Tredcroft	1,923	46	27	1.00	1.70	28[1]

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[1] Ice conditions.

Daily Gauge Height and Discharge of Spius Creek at Canford for 1915.

(Drainage area, 344 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	....	....	1.63	250	2.34	680	2.18	560
2	....	....	....	....	....	....	2.26	620	2.34	680	2.10	510
3	....	....	....	....	....	....	2.88	1,150	....	800	2.13	530
4	....	....	....	....	....	....	2.59	880	2.66	950	2.20	580
5	....	....	....	....	....	....	2.43	750	2.83	1,100	2.28	640
6	....	....	....	....	....	....	2.35	690	3.34	1,620	2.35	690
7	....	....	....	....	1.10	86	2.37	700	3.83	2,130	2.28	620
8	....	....	....	....	1.08	82	2.27	630	3.80	2,100	2.10	510
9	....	....	....	....	1.04	74	2.25	610	3.03	1,300	2.05	480
10	....	....	....	....	0.98	64	2.43	750	....	1,000	2.03	470
11	....	....	....	....	0.98	64	2.43	750	2.55	850	2.00	450
12	....	....	....	28	0.98	64	2.35	690	2.48	790	2.02	460
13	....	....	....	....	0.95	59	2.38	710	2.50	810	2.05	480
14	....	....	....	....	....	....	2.45	770	2.58	880	2.18	560
15	....	....	....	....	1.25	120	2.45	770	2.40	730	2.15	550
16	....	....	....	....	1.30	135	2.75	1,030	2.38	710	2.10	510
17	....	....	....	....	1.25	120	3.10	1,370	2.28	640	2.00	450
18	....	....	....	....	1.30	135	3.30	1,570	2.62	910	1.90	390
19	....	....	....	....	1.25	120	3.56	1,850	2.88	1,150	1.88	380
20	....	....	....	....	1.25	120	3.12	1,390	2.76	1,040	1.73	300
21	....	....	....	....	1.40	160	2.77	1,050	2.65	940	1.70	285
22	....	....	....	....	1.56	220	2.47	780	2.60	900	1.67	270
23	....	....	....	....	1.78	325	2.43	750	2.58	880	1.63	250
24	....	....	....	....	1.70	285	2.48	790	2.68	970	1.75	310
25	....	....	....	....	1.65	260	2.45	770	2.50	810	1.66	265
26	....	....	....	....	1.52	205	2.50	810	2.28	630	1.55	220
27	....	....	....	....	1.55	220	2.37	700	2.50	810	1.57	225
28	....	....	....	....	1.50	200	2.47	780	2.53	830	1.50	200
29	....	....	....	....	1.55	220	2.47	780	2.23	600	1.50	200
30	....	....	....	....	1.55	220	2.30	650	2.20	580	1.53	210
31	....	....	....	....	1.59	230	....	....	2.20	580	....	....

	July.		August.		September.		October.		November.		December.	
1	1.55	215	1.40	160	1.10	86	1.00	67	....	....	....	....
2	1.50	195	1.38	155	1.10	86	1.00	67	....	....	....	....
3	1.53	210	1.32	140	1.10	86	1.00	67	....	....	....	....
4	1.57	225	1.30	135	0.98	64	1.00	67	....	....	....	....
5	1.53	210	1.22	110	0.93	56	1.00	67	....	....	....	....
6	1.50	190	1.22	110	0.90	52	1.10	86				
7	1.46	185	1.19	105	1.10	86	1.10	86				
8	1.35	145	1.14	94	1.10	86	1.08	82				
9	1.30	135	1.10	86	1.15	96	1.00	67				
10	1.20	105	1.08	82	1.15	96	0.98	64				
11	1.16	100	1.05	76	1.18	105	0.98	64				
12	1.20	105	1.05	76	1.12	90	0.98	64				
13	1.25	120	1.00	67	1.10	86	0.96	61				
14	1.40	160	1.00	67	1.04	74	0.96	61				
15	1 39	160	1.00	67	1.00	67	0.98	64				
16	1.38	155	1.10	86	1.00	67	....	....				
17	1.30	135	1.15	96	0.98	64	....	....				
18	1.29	130	1.10	86	0.98	64						
19	1.27	125	1.00	67	0.98	64						
20	1.25	120	1.00	67	0.98	64						
21	1.20	105	1.00	67	1.00	67						
22	1.20	105	1.00	67	1 00	67						
23	1.17	100	1.00	67	1.00	67						
24	1.12	90	0.98	64	1.07	80						
25	1.10	86	0.98	64	1.10	86						
26	1.14	91	0.98	64	1.07	80						
27	1.20	105	0.98	64	1.04	70						
28	1.40	160	0.96	61	1.00	67						
29	1.43	175	0.98	64	1.00	67						
30	1.45	180	1.10	86	1.00	67						
31	1.50	200	1 10	86	....	....						

Monthly Discharge of Spius Creek at Longbotham's Ranch for 1915.

(Drainage area, 344 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,850	250	860	2.50	2.79	51,200
May	2,130	580	948	2.75	3.17	58,300
June	690	200	418	1.22	1.36	24,900
July	225	86	146	0.42	0.49	9,000
August	160	61	87	0.25	0.29	5,300
September	105	52	75	0.22	0.25	4,500
The period	2,130	52	422	1.22	8.35	153,200

THOMPSON RIVER, AT SPENCES BRIDGE.—(2039).

Location.—Section 10, township 17, range 25, west of 6th meridian.

Records Available.—October 25 to December 31, 1911; January 1 to December 31, 1912; January 1 to December 31, 1913; January 1 to December 31, 1914; January 1 to December 31, 1915.

Drainage Area.—Twenty-one thousand square miles.

Gauge.—Gauge is standard chain gauge, situated on traffic bridge, read daily by Miss Violet Curnow.

Channel.—The channel varies in width from 400 feet to 500 feet. Depth of section at high water greater by 16 feet than at low. Velocities range from 2 to 11 feet per second.

Discharge Measurements.—Measurements are made from traffic bridge. Owing to great velocity at high water, meterings are difficult to obtain. However, curve is well defined.

Winter Flow.—River usually remains open throughout the year.

Accuracy.—"B." Results are considered to be quite accurate at all stages.

Discharge Measurements of Thompson River at Spences Bridge.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Oct. 25	C. E. Richardson	1,048	297	2,780	3.7	4.0	10,300
Nov. 25	C. E. Richardson	1,048	340	2,435	3.4	2.8	8,180
1912							
Feb. 17	C. G. Cline	1,046	324	2,200	2.7	1.4	5,900
Mar. 30	C. G. Cline	1,046	330	1,960	2.4	1.2	4,770
May 1	C. E. Richardson	1,048	485	3,800	5.5	6.5	20,700
May 25	C. G. Cline	1,046	464	8,080	10.5	15.9	84,900
July 25	C. B. Corbould	1,044	433	6,135	8.1	11.7	50,000
1913							
May 8	Chisholm & Cline	1,044	400	4,351	5.4	7.1	23,600
June 16	K. G. Chisholm	1,055	511	8,989	10.7	17.7	95,700
June 18	Chisholm & Cline	1,044	503	9,229	10.8	18.1	100,000
Aug. 12	K. G. Chisholm	1,055	446	5,735	7.4	11.4	42,700
1915							
Feb. 13	E. H. Tredcroft	1,923	357	2,058	2.5	1.7	5,150

Daily Gauge Height and Discharge of Thompson River at Spences Bridge for 1915.

(Drainage area, 21,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.20	8,550	1.70	5,640	1.50	5,420	2.50	6,800	9.20	33,800	14.25	67,300
2	3.20	8,550	1.70	5,640	1.45	5,370	2.70	7,240	9.50	35,400	14.00	65,200
3	3.10	8,270	1.60	5,530	1.50	5,420	3.00	8,000	9.70	36,400	13.70	62,800
4	3.10	8,270	1.60	5,530	1.50	5,420	3.25	8,690	9.70	36,400	13.50	61,200
5	3.10	8,270	1.60	5,530	1.50	5,420	3.40	9,110	10.00	38,000	13.50	61,200
6	3.00	8,000	1.60	5,530	1.50	5,420	4.20	11,500	10.30	39,700	13.30	59,600
7	3.00	8,000	1.60	5,530	1.50	5,420	4.75	13,500	10.60	41,300	13.20	58,800
8	2.90	7,740	1.70	5,640	1.45	5,370	6.30	15,700	11.30	45,500	13.20	58,800
9	2.80	7,490	1.80	5,750	1.40	5,330	5.50	16,500	11.80	48,700	13.20	58,800
10	2.70	7,240	1.80	5,750	1.40	5,330	5.70	17,300	12.40	52,800	13.25	59,200
11	2.70	7,240	1.70	5,640	1.40	5,330	5.80	17,800	12.80	55,700	13.15	58,400
12	2.60	7,000	1.70	5,640	1.40	5,330	5.90	18,200	....	58,800	....	56,300
13	2.55	6,900	1.70	5,640	1.40	5,330	6.10	19,100	13.60	62,000	12.60	54,200
14	2.50	6,800	1.70	5,640	1.40	5,330	6.30	20,000	13.50	61,200	12.45	53,200
15	2.40	6,620	1.70	5,640	1.40	5,330	6.45	20,700	13.45	60,800	12.30	52,100
16	2.40	6,620	1.70	5,640	1.40	5,330	6.85	22,500	....	60,600	12.30	52,100
17	2.40	6,620	1.60	5,530	1.50	5,420	7.30	24,600	13.40	60,400	12.30	52,100
18	2.35	6,530	1.60	5,530	1.55	5,470	7.70	26,400	13.35	60,000	12.50	53,500
19	2.30	6,450	1.60	5,530	1.60	5,530	7.90	27,300	13.30	59,600	12.80	55,700
20	2.30	6,450	1.60	5,530	1.65	5,580	8.30	29,300	13.35	60,000	12.90	56,500
21	2.20	6,290	1.60	5,530	1.70	5,640	8.70	31,300	....	63,800	12.85	56,100
22	2.10	6,140	1.60	5,530	1.80	5,750	8.90	32,300	14.30	67,700	12.80	55,700
23	2.00	6,000	1.60	5,530	1.90	5,870	....	32,300	14.50	69,400	....	54,900
24	1.90	5,870	1.55	5,470	2.00	6,000	....	32,300	14.90	72,700	12.60	54,200
25	1.80	5,750	1.50	5,420	2.10	6,140	8.90	32,300	15.10	74.500	12.30	52,100
26	1.80	5,750	1.50	5,420	2.20	6,290	9.00	32,800	15.00	73,600	12.70	55,000
27	1.80	5,750	1.50	5,420	2.30	6,450	9.00	32,800	14.90	72,700	13.40	60,400
28	1.75	5,690	1.50	5,420	2.40	6,620	9.10	33,300	14.80	71,900	13.40	60,400
29	1.70	5,640	....	....	2.40	6,620	9.10	33,300	14.70	71,100	13.40	60,400
30	1.70	5,640	....	....	2.50	6,800	9.10	33,300	14.65	70,700	13.20	58,800
31	1.70	5,640	....	....	2.50	6,800	....	....	14.55	69,800	....	....

	July.		August.		September.		October.		November.		December.	
1	....	58,600	12.50	53,500	9.20	33,800	4.90	14,000	5.70	17,300	3.30	8,830
2	13.15	58,400	12.50	53,500	8.70	31,300	4.80	13,600	5.60	16,900	3.30	8,830
3	13.10	58,000	12.50	53,500	8.60	30,800	4.80	13,600	5.50	16,500	3.25	8,690
4	13.00	57,200	12.45	53,200	8.60	30,800	4.80	13,600	5.40	16,100	3.20	8,550
5	13.00	57,200	12.40	52,800	8.55	30,500	4.70	13,300	5.30	15,700	3.20	8,550
6	12.90	56,500	12.30	52,100	8.50	30,300	4.50	12,500	5.20	15,200	3.10	8,270
7	12.80	55,700	12.10	50,700	8.40	29,800	4.40	12,200	5.20	15,200	3.15	8,410
8	12.80	55,700	11.90	49,300	8.50	30,300	4.50	12,500	5.10	14,800	3.20	8,550
9	13.00	57,200	11.70	48,000	8.10	28,300	4.50	12,500	5.00	14,400	3.20	8,550
10	12.80	55,700	11.60	47,400	7.60	26,000	4.10	11,200	4.90	14,000	3.20	8,550
11	12.70	55,000	11.50	46,700	7.20	24,100	4.05	11,000	4.80	13,600	3.15	8,410
12	12.80	55,700	11.40	46,100	6.90	22,700	4.00	10,800	4.70	13,300	3.10	8,270
13	12.80	55,700	11.25	45,100	6.40	20,400	4.00	10,800	4.60	12,900	3.10	8,270
14	12.75	55,400	11.10	44,200	6.30	20,000	3.95	10,700	4.50	12,500	3.05	8,130
15	12.60	54,200	11.00	43,600	6.15	19,300	3.95	10,700	4.40	12,200	3.05	8,130
16	12.50	53,500	10.90	43,000	....	18,300	3.90	10,500	4.20	11,500	3.00	8,000
17	....	57,300	10.70	41,900	5.70	17,300	3.85	10,400	4.15	11,300	3.00	8,000
18	13.50	61,200	10.60	41,300	5.70	17,300	3.75	10,100	4.10	11,200	2.90	7,740
19	13.60	62,000	10.45	40,500	5.70	17,300	3.70	9,950	4.05	11,000	2.80	7,490
20	13.60	62,000	10.30	39,700	5.75	17,500	3.70	9,950	4.00	10,800	2.80	7,490
21	13.50	61,200	10.25	39,400	5.80	17,800	3.80	10,200	4.00	10,800	2.70	7,240
22	13.40	60,400	10.20	39,100	5.80	17,800	4.00	10,800	3.90	10,500	2.70	7,240
23	13.30	59,600	10.10	38,500	5.60	16,900	4.20	11,500	3.80	10,200	2.80	7,490
24	13.20	58,800	10.00	38,000	....	16,500	4.60	12,900	3.70	9,950	2.70	7,240
25	12.90	56,500	9.90	37,500	....	16,000	4.90	14,000	3.60	9,670	......	7,240
26	12.90	56,500	9.80	37,000	......	16,000	5.10	14,800	3.50	9,390	2.70	7,240
27	12.90	56,500	9.70	36,400	......	15,500	5.30	15,700	3.40	9,110	2.70	7,240
28	12.80	55,700	9.60	35,900	......	15,000	5.30	15,700	3.40	9,110	2.50	6,800
29	12.70	55,000	9.40	34,900	....	15,000	5.35	15,900	3.35	8,970	2.40	6,620
30	12.60	54,200	9.30	34,400	....	14,500	5.40	16,100	3.35	8,970	2.30	6,450
31	12.55	53,900	9.20	33,800	......	....	5.50	16,500	....	....	2.20	6,290

Monthly Discharge of Thompson River at Spences Bridge for 1915.

(Drainage area, 21,000 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	8,550	5,640	6,830	0.32	0.37	420,000
February	5,750	5,420	5,560	0.26	0.28	309,000
March	6,800	5,330	5,710	0.27	0.31	351,000
April	33,300	6,800	22,210	1.06	1.18	1,321,000
May	74,500	33,800	57,580	2.74	3.16	3,540,000
June	67,300	52,100	57,500	2.73	3.05	3,420,000
July	62,000	53,500	57,110	2.72	3.14	3,510,000
August	53,500	33,800	43,580	2.08	2.40	2,680,000
September	33,800	14,500	21,900	1.04	1.16	1,303,000
October	16,500	9,950	12,520	0.60	0.69	770,000
November	17,300	8,970	12,430	0.57	0.64	716,000
December	8,830	6,290	7,830	0.37	0.43	482,000
The year	74,500	5,330	25,860	1.23	16.81	18,822,000

THOMPSON RIVER, AT KAMLOOPS.—(2040).

Location.—Lower highway bridge, below mouth of North Thompson river, at Kamloops; section 7, township 20, range 17, west of 6th meridian.

Gauge Readings.—These readings show the elevation of the water level in the Thompson and are interesting for navigation and pumping; the station has shown itself unsuitable for determining discharge. Gauge read daily by Geo. Clapperton.

Discharge Measurements.—Six meter measurements made during 1915 are listed under Miscellaneous Measurements, Kamloops district.

Mean Daily Gauge Height, in Feet, of Thompson River at Kamloops.

Day.	Jan.	Feb.	March	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	-0.2	-0.2	0.2	0.3	5.4	9.1	8.3	7.8	5.5	1.8	....	....
2	-0.2	-0.1	0.2	0.3	5.4	8.8	8.2	7.8	5.5	1.7	....	....
3	-0.2	-0.1	0.3	0.2	5.3	8.7	8.2	7.7	4.6	1.8	....	....
4	0.0	-0.1	0.3	0.9	5.4	8.5	8.1	7.9	4.5	1.8	....	....
5	0.1	-0.1	Ice	2.0	5.7	8.4	8.0	8.0	4.5	1.8	....	....
6	0.2	0.0	Jam	2.4	6.0	8.2	8.1	7.5	4.4	1.7	....	....
7	0.5	0.0	Clear.	2.5	6.4	8.5	8.2	7.2	4.5	1.6	....	....
8	0.7	0.0	-0.2	2.6	6.8	8.8	8.3	7.1	4.0	1.5	....	....
9	0.5	0.1	-0.3	2.7	7.5	8.8	8.2	7.2	3.9	1.4	....	....
10	0.6	0.2	-0.3	2.6	8.0	8.6	8.0	7.0	7.0	1.4	....	....
11	0.5	0.3	-0.3	2.7	8.6	8.2	8.1	6.7	3.3	1.3	....	....
12	0.6	0.1	-0.3	2.8	9.0	7.7	8.0	6.6	3.1	1.2	....	....
13	0.4	0.1	-0.5	2.6	8.6	7.6	7.7	6.5	2.8	1.1	....	....
14	0.4	0.1	-0.6	2.9	8.5	7.5	7.8	6.4	2.5	0.8	....	....
15	0.3	0.2	-0.7	3.4	8.3	7.5	8.0	6.3	2.2	0.7	....	....
16	0.2	0.3	-0.6	3.4	8.6	7.6	8.2	6.2	2.5	1.0	....	....
17	0.2	0.3	-0.5	3.4	8.6	7.7	9.0	6.1	2.4	0.8	....	....
18	0.2	0.2	-0.3	3.8	8.6	8.1	9.1	6.2	2.5	1.0	....	....
19	0.1	0.1	0.0	4.1	8.3	8.2	8.8	6.3	2.5	1.0	....	....
20	0.1	0.2	0.0	4.5	8.6	8.1	8.5	6.2	2.6	1.0	....	....
21	0.1	0.2	0.2	4.5	9.2	8.0	8.4	6.1	2.7	1.1	....	....
22	Frozen	0.2	0.3	4.8	9.6	8.1	8.3	6.0	2.6	1.0	....	....
23	0.0	0.3	0.3	4.6	9.9	7.7	8.4	6.2	2.5	1.2	....	....
24	0.0	0.3	0.2	4.5	10.2	7.5	8.3	6.2	2.6	1.1	....	....
25	-0.2	0.3	0.2	4.5	10.0	7.8	8.2	6.1	2.5	1.6	....	....
26	-0.2	0.3	0.1	4.5	10.0	8.1	8.0	6.0	2.2	1.7	....	....
27	-0.2	0.2	0.1	4.6	9.9	8.4	7.9	6.0	2.1	1.8	....	....
28	-0.2	0.1	0.2	4.8	9.7	8.7	7.8	5.8	2.0	1.7	....	....
29	-0.2	....	0.1	4.8	9.5	8.6	7.8	5.5	2.0	1.8	....	....
30	-0.2	....	0.2	4.9	9.7	8.4	7.8	5.4	1.8	1.9	....	....
31	....	....	0.3	....	9.5	....	7.8	5.3	....	1.8	....	....

MISCELLANEOUS METER MEASUREMENTS, 1915.

KAMLOOPS DISTRICT, KAMLOOPS DIVISION.

Date.		Stream.	Tributary To—	Locality.	Gauge Height.	Dis-charge.	Drainage Area.	Dis-charge per square mile.
					Feet.	Sec.-ft.	Sq. miles	Sec.-ft.
April	3	Alkali creek	Cherry creek	Above Cornwall's div		Dry		
April	29	Alkali creek	Cherry creek	Above Cornwall's div		Dry		
May	3	Anstey creek	Shuswap lake	Near mouth		23.5		
July	19	Anstey creek	Shuswap lake	Near mouth		12.1		
May	20	Battle creek	Clearwater river	Near mouth		80.1		
Feb.	26	Bear creek	Adams river	Adams lake road	3.00	7.7		
June	3	Bear creek	Adams river	Adams lake road	2.58	4.0		
July	3	Bear creek	Adams river	Adams lake road		3.3		
Aug.	31	Bear creek	Adams river	Adams lake road		Dry		
July	3	Bear creek	Diversion from	Adams lake road		63.0		
Aug.	31	Bear creek	Diversion from	Adams lake road		5.3		
May	21	Bear creek	Clearwater	Murtle trail		251.0		
Aug.	11	Bear creek	Clearwater	Murtle trail		16.9		
April	14	Cahilty creek	Louis creek	At road		17.5		
May	13	Cahilty creek	Louis creek	Above diversion	2.00	113.0		
July	21	Canoe creek	Shuswap lake	C. P. R. track		10.1		
April	2	Chartrand creek	Guichon creek	Chartrand's ranch		Dry		
June	4	Chartrand creek	Guichon creek	Above Savona road		3.5		
July	22	Chartrand creek	Guichon creek	Near mouth		3.3		
April	2	Chartrand spring	Guichon creek	Chartrand's ranch		0.3		
April	14	Christina creek	Louis creek	McMartins ranch		4.7		
May	12	Christina creek	Louis creek	McKnight's ranch		3.4		
May	28	Cold creek	Paul creek	Near mouth		2.7		
Aug.	3	Cold creek	Paul creek	Near mouth		0.5		
April	3	Dairy creek	Cherry creek	Near mouth		Dry		
April	3	Duffy creek	Kamloops lake	Road bridge		Dry		
April	29	Duffy creek	Kamloops lake	Road bridge		Dry		
April	13	Edwards creek	Heffley creek	Near mouth		2.8		
April	15	Fadear creek	Louis creek	Above Fadear's division	0.30	15.8		
May	13	Fadear creek	Louis creek	Above Fadear's division	0.90	35.4		
Mar.	9	Fishtrap creek	N. Thompson river	Three miles from mouth	Ice	3.4		
May	4	Fishtrap creek	N. Thompson river	Three miles from mouth	1.20	51.5		
Feb.	18	Fraser river	Straits of Georgia	Above mouth of Thompson		14,900.0		
Feb.	25	Gold creek	Adams river	Near mouth		11.9		
June	3	Gold creek	Adams river	Near mouth		270.0		
April	1	Greenstone creek	Meadow creek		Ice	1.0		
June	5	Greenstone creek	Meadow creek		0.95	10.2		
July	22	Greenstone creek	Meadow creek		0.90	6.8		
May	20	Grouse creek	Clearwater river	Near mouth		308.0		
April	2	Guichon creek	Nicola river	Above Witch creek		6.8		
June	4	Guichon creek	Nicola river	Above Witch creek		30.0		
June	7	Guichon creek	Nicola river	Above lower Nicola		106.0		
July	21	Guichon creek	Nicola river	Below Allen's house		13.8		
July	23	Guichon creek	Nicola river	Above Lower Nicola div.		70.1		
April	13	Heffley creek	Anderson's div.	Near intake		1.8		
May	12	Heffley creek	Anderson's div.	Near intake		3.8		
April	12	Heffley creek	Austin's div.	Near road		0.5		
May	11	Heffley creek	Austin's div.	Near road		Dry		
April	12	Heffley creek	Crawshaw div.	Near intake		0.5		
May	12	Heffley creek	Crawshaw div.	Near intake		1.4		
May	20	Hemp creek	Clearwater river	Near mouth		360.0		
Aug.	10	Hermon spring	Clearwater river	Hermon's ranch		0.6		
Aug.	16	Louis creek	N. Thompson river	Near mouth		78.1		
May	12	McGillivary creek	Louis creek	Cochran's ranch		109.0		
April	2	Meadow creek	Guichon creek	Near mouth	Ice	10.1		
June	7	Meadow creek	Guichon creek	Near mouth	1.37	21.5		
July	22	Meadow creek	Guichon creek	Below McClure's ranch		20.7		
April	28	Meadow creek	Shuswap lake	Near Celesta		4.1		
Mar.	24	Monte creek	Diversion from	To Summit lake		1.4		
June	16	Monte creek	Diversion from	To Summit lake		1.8		
July	5	Monte creek	Diversion from	To Summit lake	0.71	13.3		
Oct.	9	Monte creek	Diversion from	To Summit lake	0.15	0.1		
April	3	Pendleton creek	Cherry creek	Near mouth		Dry		
April	29	Pendleton creek	Cherry creek	Near mouth		0.5		
May	31	Peterson creek	Thompson river	Fish lake road		0.5		
May	31	Peterson creek	Cooper's div. from	Fish lake road		0.5		
May	31	Peterson creek	Mitchell's lower div.	Fish lake road		1.4		
July	19	Queest creek	Shuswap lake	Near mouth		37.2		
April	2	Quenville creek	Guichon creek	Quenville's ranch		Dry		
June	7	Quenville creek	Guichon creek	Above Quenville's div.		4.6		
July	23	Quenville creek	Guichon creek	Quenville's ranch		1.2		
June	10	Quilchena creek	Nicola lake	Above Guichon's div.		38.9		
July	26	Quilchena creek	Nicola lake	Near mouth		6.8		
June	7	Ray creek	Guichon creek	Ray's ranch		18.0		
July	23	Ray creek	Guichon creek	Ray's ranch		7.8		
Mar.	23	Robbins creek	Monte creek	Duck's ranch	1.05	0.3		
June	16	Robbin's creek	Monte creek	Duck's ranch	1.25	1.9		

MISCELLANEOUS METER MEASUREMENTS, 1915.—*Continued.*

KAMLOOPS DISTRICT, KAMLOOPS DIVISION.

Date.		Stream.	Tributary to—	Locality.	Gauge Height.	Dis-charge.	Drainage Area.	Dis-charge per square mile.
					Feet.	Sec.-ft.	Sq. miles	Sec.-ft.
July	22	Salmon river	Shuswap lake	Near Salmon arm	0.40	191.0		
April	17	Sullivan creek	N. Thompson river	Above diversions	0.33	0.5		
May	14	Sullivan creek	N. Thompson river	Above diversions	0.25	0.4		
Mar.	17	Thompson river	Fraser river	Below North Thompson	-0.25	4,400.0		
April	8	Thompson river	Fraser river	Below North Thompson	2.40	14,600.0		
May	3	Thompson river	Fraser river	Below North Thompson	5.30	28,600.0		
May	25	Thompson river	Fraser river	Below North Thompson	10.05	56,900.0		
July	9	Thompson river	Fraser river	Below North Thompson	8.10	46,200.0		
Aug.	9	Thompson river	Fraser river	Below North Thompson	7.35	43,500.0		
Mar.	13	N. Thompson river	Thompson river	Above Clearwater river		1,080.0		
July	12	N. Thompson river	Thompson river	C.N.R. Bridge, Kamloops		29,400.0		
Sept.	1	N. Thompson river	Thompson river	C.N.R. Bridge, Kamloops		20,200.0		
April	3	Threemile creek	Kamloops lake	Leighton's ranch		0.4		
April	29	Threemile creek	Kamloops lake	Road bridge		1.8		
June	3	Threemile creek	Kamloops lake	Kamloops-Savona road		4.8		
July	20	Threemile creek	Kamloops lake	Kamloops-Savona road		4.3		
Aug.	18	Threemile creek	Kamloops lake	Kamloops-Savona road		2.0		
June	3	Threemile creek	South-east fork	100 feet above forks		0.8		
June	3	Threemile creek	South-west fork	100 foot above forks		2.5		
July	21	Threemile creek	South-west fork	At road crossing		2.0		
April	2	Witch creek	Guichon creek	Chartrand's ranch		6.5		
June	4	Witch creek	Guichon creek	Chartrand's ranch		24.5		
July	21	Witch creek	Guichon creek	Ashcroft road		10.8		

OKANAGAN DISTRICT, KAMLOOPS DIVISION.

April	6	Ashnola creek	Similkameen river	Above diversions	0.51	96.0		
April	8	Otter river	Tulameen river	Tulameen	3.14	151.0		
June	3	Otter river	Tulameen river	Tulameen	2.75	71.6		
June	9	Nicholson's creek	Kettle river	Nicholson's bridge		13.6		
June	9	Rock creek	Kettle river	Rock creek		138.0		

ASHCROFT DISTRICT, KAMLOOPS DIVISION.

April	22	Anderson creek	Hat creek	At mouth		10.5		
April	22	Blue Earth creek	Hat creek	At mouth		0.7		
April	24	Blue Earth creek	Hat creek	At mouth		1.4		
April	27	Cache creek	Bonaparte river	Above diversions		16.2		
April	27	Clemes creek	Deadman river	Near mouth		5.2		
April	1	Colley creek	Hat creek	At wagon road		4.8		
Aug.	24	Colley creek	Hat creek	At wagon road		1.0		
May	6	Collins div.	From Bonaparte river	Collins ranch		2.4		
Aug.	23	Hammonds div.	From Hat creek	Near intake		3.6		
April	21	Hammonds div.	From Oregon Jack creek	Near intake		0.8		
April	23	Hat creek	Bonaparte river	Above diversions at mouth	3.25	57.9		
Aug.	24	Hat creek	Bonaparte river	Above diversions at mouth	2.72	21.9		
April	21	King creek	Hat creek	At wagon road		1.0		
Aug.	24	King creek	Hat creek	At wagon road		0.1		
Aug.	24	Lloyd creek	Hat creek	At mouth		0.9		
April	27	Long Lake creek	Deadman river	Above Cultus lake		0.6		
April	22	Medicine creek	Hat creek	At mouth		4.8		
Feb.	15	Nahatlatch river	Thompson river	At Nahatlatch lake		287.0		
Aug.	21	Nelson creek	Thompson river	Near mouth		0.5		
April	21	Oregon Jack creek	Thompson river	Hat creek road		3.9		
Aug.	23	Oregon Jack creek	Thompson river	Hat creek road		6.7		
April	22	Robertson creek	Hat creek	At wagon road		3.8		
April	23	Scottie creek	Bonaparte river	Above diversions	1.27	14.9		
Aug.	25	Scottie creek	Bonaparte river	Above diversions	0.79	7.7		
Aug.	26	Walhachin div.	From Deadman river	At intake		36.5		

CHRISTINA LAKE.—(2086).

Location.—Near Grand Forks; Provincial Water District No. 5.

Gauge Readings.—These readings show the level of the water in Christina lake, January 1 to December 31, 1914, and March 21 to September 30, 1915. Gauge read by W. H. Beach.

Co-operation.—This gauge was installed under the supervision of Mr. A. V. White, Consulting Engineer of the Conservation Commission and Mr. Wm. Young, Comptroller of the Provincial Water Rights Branch.

Mean Daily Gauge Height, in Feet, of Christina Lake for 1914.

DAY	JAN.	FEB.	MARCH	APRIL.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
1	1.40	....	....	2.15	5.00	4.38	2.87	1.75	1.10	1.05	1.25	1.80
2	1.40	....	....	2.20	5.05	4.35	2.85	1.75	1.10	1.05	1.32	1.75
3	1.40	....	....	2.20	5.05	4.30	2.85	1.70	1.15	1.02	1.35	1.75
4	1.40	....	....	2.25	5.22	4.30	2.85	1.70	1.00	1.00	1.40	1.75
5	1.45	....	....	2.25	5.32	4.30	2.85	1.62	0.95	1.00	1.45	1.75
6	1.45	....	....	2.32	5.20	4.30	2.80	1.62	0.90	1.00	1.50	1.75
7	1.45	....	....	2.45	5.20	4.28	2.75	1.60	0.90	1.00	1.05	1.75
8	1.45	....	....	2.50	5.20	4.22	2.77	1.51	0.90	1.00	1.60	1.75
9	1.45	....	....	2.65	5.20	4.18	2.62	1.55	0.90	1.00	1.62	1.70
10	1.50	....	....	2.85	5.17	4.02	2.55	1.50	0.90	1.00	1.65	1.70
11	1.55	....	....	3.05	5.15	3.98	2.50	1.50	0.90	1.00	1.70	1.70
12	1.55	....	....	3.20	5.10	3.82	2.42	1.45	0.90	1.00	1.75	1.70
13	1.60	....	....	3.45	5.10	3.75	2.37	1.45	0.90	1.00	1.80	1.70
14	1.65	....	....	3.65	5.02	3.75	2.30	1.45	0.90	1.00	1.80	1.70
15	1.65	....	....	4.00	5.12	3.70	2.22	1.45	0.90	1.05	1.80	1.65
16	1.67	....	....	4.40	5.15	3.70	2.20	1.45	0.90	1.05	1.85	1.65
17	1.70	....	....	4.70	5.20	3.65	2.15	1.45	0.95	1.05	1.85	1.65
18	1.75	....	....	4.80	5.17	3.62	2.15	1.40	0.95	1.05	1.85	1.65
19	1.75	....	....	4.90	5.12	3.57	2.10	1.40	0.95	1.10	1.85	1.65
20	1.80	....	1.50	5.10	5.05	3.50	2.05	1.32	1.00	1.10	1.85	1.65
21	1.80	....	1.55	5.12	5.00	3.45	1.97	1.30	1.00	1.10	1.85	1.65
22	1.85	....	1.55	5.20	4.92	3.45	1.95	1.27	1.00	1.10	1.85	1.65
23	1.85	....	1.60	5.20	4.85	3.37	1.90	1.25	1.00	1.10	1.85	1.65
24	1.85	....	1.65	5.20	4.85	3.30	1.90	1.20	1.00	1.10	1.85	1.65
25	1.85	....	1.72	5.20	4.80	3.22	1.90	1.20	1.00	1.17	1.82	1.60
26	1.85	....	1.80	5.25	4.75	3.17	1.90	1.15	1.00	1.10	1.80	1.60
27	1.85	....	1.85	5.17	4.70	3.10	1.87	1.15	....	1.10	1.80	1.60
28	1.85	....	1.90	5.10	4.62	3.00	1.85	1.15	....	1.10	1.80	1.57
29	1.80	....	1.95	5.05	4.52	3.07	1.85	1.12	....	1.15	1.80	1.55
30	....	....	2.00	5.00	4.42	3.00	1.80	1.10	....	1.15	1.80	1.55
31	....	....	2.10	....	4.40	....	1.80	1.10	....	1.20	....	1.55

Mean Daily Gauge Height, in Feet, of Christina Lake for 1915.

DAY.	JAN.	FEB.	MARCH	APRIL.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
1	....	....	....	1.95	3.90	4.67	....	....	1.50	....	....	....
2	....	....	....	2.00	3.90	4.62	....	....	1.45	....	....	....
3	....	....	....	2.05	3.95	4.55	....	....	1.42	....	....	....
4	....	....	....	2.10	3.95	4.47	....	....	1.40	....	....	....
5	....	....	....	2.15	3.95	4.40	....	....	1.35	....	....	....
6	....	....	....	2.20	3.90	4.35	....	....	1.35	....	....	....
7	....	....	....	2.32	3.90	4.30	....	....	1.30	....	....	....
8	....	....	....	2.42	3.90	4.27	....	....	1.30	....	....	....
9	....	....	....	2.52	3.90	4.22	....	....	1.25	....	....	....
10	....	....	....	2.72	3.90	4.20	....	....	1.25	....	....	....
11	....	....	....	2.72	3.90	4.10	....	....	1.20	....	....	....
12	....	....	....	2.85	3.85	3.97	....	....	1.20	....	....	....
13	....	....	....	2.97	3.85	3.87	....	....	1.20	....	....	....
14	....	....	....	3.12	3.85	3.77	....	....	1.15	....	....	....
15	....	....	....	3.87	3.95	3.67	....	....	1.15	....	....	....
16	....	....	....	3.55	3.90	3.60	....	....	1.15	....	....	....
17	....	....	....	3.65	4.00	3.55	....	....	1.15	....	....	....
18	....	....	....	3.72	4.05	3.52	....	....	1.10	....	....	....
19	....	....	....	3.77	4.12	3.47	....	....	1.10	....	....	....
20	....	....	....	3.82	4.20	3.42	....	....	1.10	....	....	....
21	....	....	1.50	3.85	4.25	3.40	....	....	1.10	....	....	....
22	....	....	1.52	3.90	4.30	3.35	....	....	1.10	....	....	....
23	....	....	1.57	3.90	4.32	3.30	....	....	1.07	....	....	....
24	....	....	1.62	3.92	4.37	3.22	....	....	1.07	....	....	....
25	....	....	1.65	3.95	4.42	3.18	....	....	1.10	....	....	....
26	....	....	1.70	3.92	4.52	3.10	....	....	1.05	....	....	....
27	....	....	1.72	3.87	4.60	3.00	....	....	1.05	....	....	....
28	....	....	1.80	3.82	4.62	2.95	....	....	1.05	....	....	....
29	....	....	1.82	3.87	4.70	2.90	....	....	1.00	....	....	....
30	....	....	1.90	3.90	4.70	2.85	....	....	1.00	....	....	....
31	....	....	1.95	....	4.70	....	....	....	....	....	....	....

SHUSWAP LAKE.—(2087).

Location.—At Sicamous; section 35, township 21, range 8, west of 6th meridian.

Gauge Readings.—Taken weekly by K. R. Finlayson. They give the level of Shuswap lake, useful information for navigation, pumping, etc.

Gauge Readings of Shuswap Lake at Sicamous for 1915.

DAY.	JAN.	FEB.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
1									4.5			2.3
2												
3											2.6	
4												
5												
6										2.7		
7												
8												2.0
9									3.9			
10											2.7	
11												
12								4.6				
13										2.4		
14								4.6				
15									3.4			2.0
16												
17											2.4	
18												
19												
20										2.2		
21												
22									3.3			2.0
23												
24										2.4	2.3	
25												
26												
27												
28												
29									3.0			
30												
31												

REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER VIII.

Nelson Division—Hydrometric Data.

CHAPTER VIII.

NELSON DIVISION—HYDROMETRIC DATA.

NELSON DISTRICT.

CARPENTER CREEK.—(3025).

Location.—The station is in the flume back of the C.P.R. depot, at Sandon.

Records Available.—1914 and 1915.

Drainage Area.—Twelve square miles.

Climatic Conditions.—Summers hot. May and June generally wet. Little rain during July and August. Winters mild. Snowfall is not heavy in the lower altitudes. Frazil ice is a possibility.

Gauge.—Enamel gauge, 0 feet to 3 feet, nailed to side of flume; daily readings are made by Mrs. E. A. Cameron.

Flume.—The creek is carried through Sandon in a box flume, 11.67 feet wide and 6 feet deep. Kutter's formula was applied to determine the discharges.

Accuracy.—During high water results are probably within 10 per cent, but at low stages, as the gauge reads only to tenths, no accuracy can be given.

Daily Gauge Height and Discharge of Carpenter Creek at Sandon for 1915.

(Drainage area, 12 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.10	18	0.05	12	0.05	12	0.05	12	0.55	144	0.70	200
2	0.10	18	0.05	12	0.05	12	0.08	16	0.62	170	0.62	170
3	0.05	12	0.05	12	0.05	12	0.10	18	0.68	192	0.60	162
4	0.05	12	0.05	12	0.05	12	0.10	18	0.70	200	0.65	181
5	0.05	12	0.05	12	0.05	12	0.10	18	0.75	222	0.72	208
6	0.05	12	0.05	12	0.05	12	0.10	18	0.75	222	0.72	208
7	0.05	12	0.05	12	0.05	12	0.10	18	0.80	243	0.82	252
8	0.05	12	0.05	12	0.05	12	0.10	18	0.88	279	0.72	208
9	0.05	12	0.05	12	0.05	12	0.13	25	0.88	279	0.62	170
10	0.05	12	0.05	12	0.05	12	0.15	29	0.82	252	0.60	162
11	0.05	12	0.05	12	0.05	12	0.15	29	0.72	208	0.60	162
12	0.05	12	0.05	12	0.05	12	0.15	29	0.65	181	0.68	192
13	0.05	12	0.05	12	0.05	12	0.15	29	0.65	181	0.70	200
14	0.05	12	0.05	12	0.05	12	0.15	29	0.65	181	0.70	200
15	0.05	12	0.05	12	0.05	12	0.18	36	0.65	181	0.80	243
16	0.05	12	0.05	12	0.05	12	0.22	45	0.65	181	0.70	200
17	0.05	12	0.05	12	0.05	12	0.28	63	0.62	170	0.72	208
18	0.05	12	0.05	12	0.05	12	0.35	80	0.62	170	0.68	192
19	0.05	12	0.05	12	0.05	12	0.40	94	0.60	162	0.60	162
20	0.05	12	0.05	12	0.05	12	0.40	94	0.65	181	0.62	162
21	0.05	12	0.05	12	0.05	12	0.35	80	0.78	234	0.62	162
22	0.05	12	0.05	12	0.05	12	0.30	66	0.82	252	0.65	181
23	0.05	12	0.05	12	0.05	12	0.30	66	0.80	243	0.70	200
24	0.05	12	0.05	12	0.05	12	0.30	66	0.80	243	0.70	200
25	0.05	12	0.05	12	0.05	12	0.30	66	0.78	234	0.65	181
26	0.05	12	0.05	12	0.05	12	0.30	66	0.70	200	0.58	155
27	0.05	12	0.05	12	0.05	12	0.30	66	0.70	200	0.53	145
28	0.05	12	0.05	12	0.05	12	0.56	148	0.90	288	0.60	162
29	0.05	12	....	....	0.05	12	0.55	144	0.80	243	0.65	181
30	0.05	12	....	....	0.05	12	0.70	200	0.80	243	0.73	213
31	0.05	12	....	....	0.05	12	....	....	0.70	200	....	....

	July.		August.		September.		October.		November.		December.	
1	0.75	222	0.30	66	0.10	18	0.10	18	0.15	29	0.10	18
2	0.85	222	0.30	66	0.10	18	0.15	29	0.15	29	0.10	18
3	0.70	200	0.30	66	0.10	18	0.10	18	0.15	29	0.10	18
4	0.68	192	0.25	53	0.10	18	0.10	18	0.15	29	0.10	18
5	0.65	181	0.25	53	0.10	18	0.10	18	0.15	29	0.10	18
6	0.65	181	0.25	53	0.10	18	0.10	18	0.15	29	0.10	18
7	0.62	170	0.20	40	0.10	18	0.10	18	0.10	18	0.10	18
8	0.60	162	0.20	40	0.10	18	0.10	18	0.10	18	0.10	18
9	0.58	155	0.20	40	0.10	18	0.10	18	0.10	18	0.10	18
10	0.50	136	0.20	40	0.18	36	0.10	18	0.10	18	0.10	18
11	0.42	100	0.20	40	0.10	18	0.10	18	0.10	18	0.10	18
12	0.35	80	0.15	29	0.10	18	0.10	18	0.10	18	0.10	18
13	0.45	110	0.15	29	0.10	18	0.10	18	0.10	18	0.10	18
14	0.52	133	0.15	29	0.10	18	0.15	29	0.10	18	0.10	18
15	0.58	155	0.15	29	0.10	18	0.10	18	0.10	18	0.10	18
16	0.65	181	0.15	29	0.12	22	0.10	18	0.10	18	0.10	18
17	0.70	200	0.15	29	0.15	29	0.10	18	0.10	18	0.10	18
18	0.68	192	0.15	29	0.15	29	0.15	29	0.10	18	0.10	18
19	0.65	181	0.15	29	0.15	29	0.15	29	0.10	18	0.10	18
20	0.60	162	0.30	66	0.15	29	0.15	29	0.10	18	0.10	18
21	0.55	144	0.25	53	0.15	29	0.15	29	0.10	18	0.10	18
22	0.45	110	0.20	53	0.15	29	0.15	29	0.10	18	0.10	18
23	0.37	86	0.15	29	0.15	29	0.18	36	0.10	18	0.10	18
24	0.35	80	0.15	29	0.20	40	0.20	40	0.10	18	0.10	18
25	0.35	80	0.15	29	0.15	29	0.20	40	0.10	18	0.10	18
26	0.35	80	0.15	29	0.15	29	0.20	40	0.10	18	0.10	18
27	0.35	80	0.10	18	0.15	29	0.20	40	0.10	18	0.10	18
28	0.35	80	0.10	18	0.15	29	0.22	45	0.10	18	0.10	18
29	0.30	66	0.20	18	0.15	29	0.22	45	0.10	18	0.10	18
30	0.30	66	0.10	18	0.10	18	0.20	40	0.10	18	0.10	18
31	0.30	66	0.10	18	....	....	0.20	40	....	....	0.10	18

Monthly Discharge of Carpenter Creek at Sandon for 1915.
(Drainage area, 12 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	18.0	12.0	12.4	1.03	1.19	762
February	12.0	12.0	12.0	1.00	1.04	666
March	12.0	12.0	12.0	1.00	1.15	739
April	200.0	12.0	56.2	4.68	5.22	3,340
May	288.0	144.0	212.0	17.70	20.40	13,000
June	252.0	145.0	187.0	15.60	17.40	11,100
July	222.0	66.0	137.0	11.40	13.10	8,420
August	66.0	18.0	37.6	3.13	3.61	2,310
September	40.0	18.0	23.9	1.99	2.22	1,420
October	45.0	18.0	27.1	2.25	2.61	1,670
November	29.0	18.0	20.2	1.68	1.87	1,200
December	18.0	18.0	18.0	1.50	1.73	1,110
The Year	288.0	12.0	62.9	5.25	71.54	45,737

Note.—As the gauge is read only to the nearest tenth, no accuracy can be given for the lower flow. At higher stages results are probably within 10 per cent.

COLUMBIA RIVER, CASTLEGAR.—(3004).

Location.—At C.P.R. bridge, near Castlegar.

Records Available.—1913-14-15.

Drainage Area.—Fifteen thousand square miles.

Climatic Conditions.—Summers hot, with plenty of rain in May and June, but very little during July and August. In winter the snowfall is not heavy, and the temperature seldom goes below zero. The river rarely freezes over.

Gauge.—A chain gauge read daily by Mr. W. J. Farmer.

Channel.—Straight for 200 yards above and below section. A pronounced riffle in low water is lost during high water. The rise and fall of the river is about 25 feet.

Discharge Measurements.—The 1915 curve is based on fifteen measurements made during 1913-14-15.

Accuracy.—"A" and "B." During 1915 as no very high water was encountered results are probably within 5 and 10 per cent.

Discharge Measurements of Columbia River at Castlegar (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec.-ft.
1913							
June 14	(Prov.) Lawley			20,100	7.88	28.2	158,000
July 5	(Prov.) Lawley			16,500	6.94	21.6	115,000
Sept. 5	(Prov.) Lawley			12,200	5.55	13.0	67,600
Nov. 25	Richardson	1,527	440	7,730	2.04	3.2	15,800
1914							
Jan. 14	Webb	1,048	380	6,800	1.66	1.7	11,300
Mar. 5	Richardson	1,672	398	6,170	1.24	0.72	7,680
May 31	Elliott	1,909	515	14,100	5.82	16.12	62,100
July 28	Beeston	1,672	530	13,500	7.67	17.52	104,000
1915							
Feb. 28	Richardson & Beeston	1,929	400	6,510	1.21	0.70	7,920
April 26	Corbould & Beeston	1,927	480	9,250	3.73	7.23	34,500
May 6	Richardson & Dempster	1,929	493	10,200	4.28	9.30	43,700
June 2	Dempster	1,909	513	12,400	5.70	14.40	71,500

Daily Gauge Height and Discharge of Columbia River at Castlegar for 1915.

(Drainage area, 15,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.3	9,530	0.9	8,450	0.6	7,700	1.3	9,530	8.3	39,400	14.6	73,300
2	1.2	9,250	0.9	8,450	0.6	7,700	1.3	9,530	8.4	39,900	14.3	71,600
3	1.3	9,530	0.9	8,450	0.6	7,700	1.5	10,100	8.6	40,900	14.1	70,500
4	1.4	9,820	0.9	8,450	0.6	7,700	1.8	11,000	8.9	42,500	14.0	69,900
5	1.5	10,100	0.9	8,450	0.6	7,700	2.0	11,600	9.0	43,000	14.0	69,900
6	1.4	9,820	0.9	8,450	0.6	7,700	2.4	12,800	9.3	44,600	13.8	68,800
7	1.3	9,530	0.8	8,200	0.6	7,700	2.7	13,900	9.5	45,600	13.3	66,100
8	1.2	9,250	0.8	8,200	0.5	7,450	2.9	14,600	9.8	47,200	13.5	67,200
9	1.1	8,980	0.8	8,200	0.5	7,450	3.0	14,900	10.2	49,400	13.6	67,700
10	1.1	8,980	0.8	8,200	0.5	7,450	3.1	15,300	10.5	51,000	13.4	66,700
11	1.0	8,710	0.8	8,200	0.5	7,450	3.3	16,000	10.9	53,200	13.4	66,700
12	1.1	8,980	0.8	8,200	0.5	7,450	3.4	16,400	11.6	56,900	13.6	67,700
13	1.1	8,980	0.8	8,200	0.5	7,450	3.6	17,200	12.6	62,300	13.4	66,700
14	1.1	8,980	0.7	7,950	0.5	7,450	3.9	18,400	13.5	67,200	13.3	66,100
15	1.1	8,980	0.7	7,950	0.5	7,450	4.0	18,800	13.8	68,800	13.2	65,600
16	1.1	8,980	0.7	7,950	0.5	7,450	4.4	20,300	13.9	69,400	13.0	64,500
17	1.1	8,980	0.7	7,950	0.5	7,450	4.7	21,500	13.6	67,700	12.9	64,000
18	1.1	8,980	0.7	7,950	0.6	7,700	4.9	22,300	13.0	64,500	12.8	63,400
19	1.1	8,980	0.7	7,950	0.6	7,700	5.0	22,800	13.0	64,500	12.4	61,300
20	1.1	8,980	0.7	7,950	0.6	7,700	5.4	24,600	13.2	65,600	12.6	62,300
21	1.1	8,980	0.7	7,950	0.7	7,950	5.8	26,500	13.2	65,600	13.0	64,500
22	1.1	8,980	0.7	7,950	0.7	7,950	6.2	28,500	13.5	67,200	13.5	67,200
23	1.1	8,980	0.7	7,950	0.7	7,950	6.5	30,000	13.2	65,600	14.0	69,900
24	1.0	8,710	0.7	7,950	0.8	8,200	6.8	31,600	12.9	64,000	14.0	69,900
25	1.0	8,710	0.7	7,950	0.9	8,450	7.0	32,600	13.0	64,500	14.3	71,600
26	1.0	8,710	0.7	7,950	1.0	8,710	7.2	33,600	13.1	65,000	14.4	72,100
27	1.0	8,710	0.7	7,950	1.0	8,710	7.5	35,200	13.5	67,200	14.6	73,300
28	1.0	8,710	0.7	7,950	1.0	8,710	7.5	35,200	13.6	67,700	15.0	75,500
29	1.0	8,710	....	....	1.1	8,980	7.7	36,200	13.7	68,300	15.4	77,700
30	0.9	8,450	....	....	1.1	8,980	7.9	37,300	14.0	69,900	15.6	78,900
31	0.9	8,450	....	....	1.1	8,980	....	....	14.3	71,600	....	....

	July.		August.		September.		October.		November.		December.	
1	15.8	80,000	16.1	81,700	14.8	74,400	6.1	28,000	4.0	18,800	3.0	14,900
2	15.9	80,500	15.5	78,300	14.9	74,900	5.9	27,000	4.5	20,700	3.0	14,900
3	16.0	81,100	15.9	80,500	14.8	74,400	5.7	26,100	4.7	21,500	3.0	14,900
4	16.0	81,100	16.1	81,700	14.7	73,800	5.6	25,600	4.8	21,900	3.0	14,900
5	15.9	80,500	16.1	81,700	14.6	73,300	5.4	24,600	4.8	21,900	2.9	14,600
6	15.6	78,900	16.1	81,700	14.6	73,300	5.3	24,100	4.8	21,900	2.9	14,600
7	16.5	83,900	15.9	80,500	14.0	69,900	5.2	23,700	4.7	21,500	2.8	14,200
8	16.2	82,200	15.8	80,000	13.3	66,100	5.0	22,800	4.8	21,900	2.8	14,200
9	16.4	83,300	16.6	84,500	12.6	62,300	4.9	22,300	4.8	21,900	2.8	14,200
10	16.8	85,600	16.8	85,600	12.0	59,100	4.9	22,300	4.8	21,900	2.9	14,600
11	16.6	84,500	16.9	86,100	11.4	55,900	4.9	22,300	4.7	21,500	2.8	14,200
12	16.5	83,900	16.7	85,000	11.0	53,700	4.5	20,700	4.7	21,500	2.8	14,200
13	16.8	85,600	16.6	84,500	10.8	52,600	4.4	20,300	4.6	21,100	2.6	13,500
14	16.5	83,900	16.5	83,900	10.6	51,500	4.2	19,600	4.5	20,700	2.6	13,500
15	16.6	84,500	16.5	83,900	10.0	48,300	4.1	19,200	4.3	19,900	2.6	13,500
16	....	83,100	16.4	83,300	9.5	45,600	4.1	19,200	4.0	18,800	2.7	13,900
17	16.1	81,700	16.4	83,300	9.0	43,000	4.0	18,800	3.9	18,400	2.4	12,800
18	16.0	81,100	16.0	81,100	8.5	40,400	3.8	18,000	3.8	18,000	2.3	12,500
19	15.9	80,500	15.8	80,000	8.2	38,800	3.8	18,000	3.8	18,000	2.3	12,500
20	15.1	76,100	15.8	80,000	8.0	37,800	3.8	18,000	3.7	17,600	2.2	12,200
21	15.5	78,300	15.6	78,900	7.8	36,800	3.7	17,600	3.7	17,600	2.0	11,600
22	15.5	78,300	15.5	78,300	7.5	35,200	3.5	16,800	3.6	17,200	1.9	11,300
23	15.6	78,900	15.0	75,500	7.2	33,600	3.5	16,800	3.5	16,800	1.8	11,000
24	15.6	78,900	15.6	78,900	7.0	32,600	3.5	16,800	3.4	16,400	1.7	10,700
25	16.1	81,700	16.0	81,100	6.8	31,600	3.5	16,800	3.4	16,400	1.7	10,700
26	15.8	80,000	16.0	81,100	6.6	30,500	3.5	16,800	3.2	15,700	1.7	10,700
27	15.9	80,500	16.0	81,100	6.2	28,500	3.7	17,600	3.2	15,700	1.8	11,000
28	15.7	79,400	15.5	78,300	6.0	27,500	3.7	17,600	3.1	15,300	1.8	11,000
29	15.9	80,500	15.5	78,300	5.7	26,100	3.6	17,200	3.0	14,900	1.7	10,700
30	15.8	80,000	15.6	78,900	5.5	25,100	3.8	18,000	3.0	14,900	1.7	10,700
31	15.7	79,400	15.6	78,900	....	....	3.8	18,000	....	....	1.7	10,700

Monthly Discharge of Columbia River at Castlegar for 1915.

(Drainage area, 15,000 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	10,100	8,450	9,050	0.60	0.69	556,000
February	8,450	7,950	8,120	0.54	0.56	451,000
March	8,980	7,450	7,910	0.53	0.61	486,000
April	37,300	9,530	21,600	1.44	1.61	1,290,000
May	71,600	39,400	58,700	3.91	4.51	3,610,000
June	78,900	61,300	68,700	4.58	5.11	4,090,000
July	85,600	76,100	81,200	5.41	6.24	5,000,000
August	86,100	75,500	81,200	5.41	6.24	5,000,000
September	74,900	25,100	49,200	3.28	3.66	2,930,000
October	28,000	16,800	20,300	1.35	1.56	1,250,000
November	21,900	14,900	19,000	1.27	1.42	1,130,000
December	14,900	10,700	12,900	0.86	0.99	793,000
The year	86,100	7,450	36,490	2.43	33.20	26,586,000

COLUMBIA RIVER, TRAIL.—(3008).

Location.—The station is at the highway bridge, near Trail, 15 miles above International boundary and above mouth of Pend d'Oreille river.

Records Available.—1913-14-15.

Drainage Area.—Thirty-four thousand square miles.

Climatic Conditions.—Considerable rain usually falls in the spring. June, July, August and September are usually dry. October and November are generally unsettled, but not cold. Winters are mild, and the summers hot

Gauge.—Chain gauge used and read by Mr. C. A. Broderick.

Channel.—The river has a bend about 100 yards above the bridge. Below the river is straight for 400 yards. Control appears to be permanent, and is a pronounced riffle 100 yards below section.

Discharge Measurements.—The 1915 curve is based on twenty measurements, during 1913-14-15. These measurements were well distributed.

Accuracy.—"B" and "C." Reliable daily gauge readings have been obtained. The rating curve appears reliable. Results should be within 10 or 15 per cent.

Discharge Measurements of Columbia River at Trail (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
Dec. 18	(Prov.) Wilson	....	480	6,640	2.79	10.5	18,600
1913							
Mar. 5	(Prov.) Wilson	....	460	5,640	2.53	8.5	14,300
May 1	Richardson	1,048	515	9,360	6.30	15.4	58,700
May 21	(Prov.) Biker	1,527	532	11,200	7.30	19.0	82,200
July 4	(Prov.) Lawley	1,527	663	20,100	10.9	34.5	219,000
June 11	Richardson	1,048	687	23,900	12.4	40.2	297,000
July 21	(Prov.) Lawley	1,527	580	15,800	9.63	27.6	152,000
Aug. 6	(Prov.) Lawley	1,527	583	15,100	9.42	26.1	142,000
Aug. 7	Richardson & Elliott	1,048	583	15,200	9.65	26.1	145,000
Sept. 4	(Prov.) Lawley	1,527	547	12,300	7.93	21.0	97,000
Nov. 5	Richardson	1,048	509	7,630	4.86	13.1	37,100
1914							
Jan. 15	Webb	1,048	485	6,250	3.57	9.5	22,300
April 17	Webb	1,048	493	7,120	3.51	10.5	25,000
June 2	Elliott	1,909	610	15,600	9.70	28.3	151,000
July 17	Elliott	1,909	640	19,200	11.09	33.7	213,000
Nov. 11	Elliott	1,909	515	9,110	5.43	14.6	49,000
1915							
Jan. 4	Elliott	1,929	490	6,940	3.42	10.0	23,800
Feb. 11	Corbould	1,909	470	6,290	2.74	8.8	17,100
June 4	Dempster & Beeston	1,909	566	14,400	8.69	24.7	125,000
Aug. 9	Dempster & Beeston	1,927	570	15,000	9.60	25.9	144,000
Dec. 23	Richardson & Dempster	1,927	490	6,160	3.10	10.2	19,100

Daily Gauge Height and Discharge of Columbia River at Trail for 1915.

(Drainage area, 34,000 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	9.9	21,500	9.0	17,000	8.7	15,500	10.2	23,100	18.3	74,400	24.9	129,000
2	10.0	22,000	9.0	17,000	8.7	15,500	10.4	24,100	18.5	76,000	24.8	128,000
3	10.0	22,000	8.9	16,500	8.7	15,500	10.8	26,300	18.7	77,600	24.7	127,000
4	10.0	22,000	8.9	16,500	8.7	15,500	11.2	28,500	19.1	80,800	24.7	127,000
5	10.1	22,500	9.0	17,000	8.7	15,500	11.4	29,500	19.4	83,200	24.6	126,000
6	10.0	22,000	8.9	16,500	8.7	15,500	11.6	30,600	19.6	84,800	24.5	125,000
7	9.9	21,500	8.9	16,500	8.7	15,500	11.8	31,700	20.1	88,800	24.5	125,000
8	9.8	21,000	8.9	16,500	8.7	15,500	12.0	32,800	20.5	92,000	24.4	125,000
9	9.8	21,000	9.0	17,000	8.8	16,000	12.1	33,400	20.9	95,200	24.3	124,000
10	9.7	20,500	9.0	17,000	8.8	16,000	12.2	34,000	21.2	97,600	24.2	123,000
11	9.7	20,500	9.0	17,000	8.8	16,000	12.3	34,500	21.5	100,000	24.1	122,000
12	9.7	20,500	8.9	16,500	8.8	16,000	12.4	35,100	21.8	103,000	24.0	121,000
13	9.7	20,500	8.9	16,500	8.8	16,000	12.5	35,700	22.2	105,000	23.9	120,000
14	9.7	20,500	8.9	16,500	8.9	16,500	12.7	36,900	22.6	109,000	23.8	119,000
15	9.7	20,500	8.8	16,000	8.9	16,500	12.9	38,000	23.2	114,000	23.7	118,000
16	9.6	20,000	8.8	16,000	8.9	16,500	13.2	39,800	23.8	119,000	23.6	117,000
17	9.6	20,000	8.8	16,000	8.9	16,500	13.6	42,200	24.3	124,000	23.6	117,000
18	9.5	19,500	8.8	16,000	9.0	17,000	14.3	46,500	24.7	127,000	23.6	117,000
19	9.6	20,000	8.8	16,000	9.0	17,000	14.9	50,400	24.8	128,000	23.6	117,000
20	9.6	20,000	8.8	16,000	9.0	17,000	15.5	54,400	24.7	127,000	23.7	118,000
21	9.6	20,000	8.8	16,000	9.0	17,000	16.0	57,700	24.7	127,000	23.8	119,000
22	9.5	19,500	8.9	16,500	9.1	17,500	16.3	59,800	24.8	128,000	23.9	120,000
23	9.4	19,000	8.9	16,500	9.2	18,000	16.6	62,000	24.8	128,000	24.0	121,000
24	9.3	18,500	8.9	16,500	9.3	18,500	16.9	64,100	24.8	128,000	24.2	123,000
25	9.3	18,500	8.9	16,500	9.4	19,000	17.1	65,500	24.7	127,000	24.3	124,000
26	9.2	18,000	8.9	16,500	9.5	19,500	17.3	66,900	24.7	127,000	24.3	124,000
27	9.1	17,500	8.8	16,000	9.6	20,000	17.5	68,400	24.7	127,000	24.5	125,000
28	9.0	17,000	8.8	16,000	9.7	20,500	17.6	69,100	24.8	128,000	24.8	128,000
29	9.0	17,000	....	....	9.8	21,000	17.8	70,600	24.9	129,000	25.2	132,000
30	9.1	17,500	....	....	9.9	21,500	18.0	72,000	24.9	129,000	25.7	137,000
31	9.1	17,500	....	....	10.0	22,000	....	....	24.9	129,000	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	26.0	140,000	25.5	135,000	23.6	117,000	14.2	45,900	12.6	36,300	11.4	29,500
2	26.1	141,000	25.6	136,000	23.4	116,000	14.0	44,600	12.7	36,900	11.3	29,000
3	26.2	142,000	25.7	137,000	23.1	113,000	14.0	44,600	12.7	36,900	11.3	29,000
4	26.3	143,000	25.7	137,000	22.8	110,000	13.9	44,000	12.8	37,400	11.2	28,500
5	26.4	144,000	25.8	138,000	22.4	107,000	13.8	43,400	12.8	37,400	11.2	28,500
6	26.6	146,000	25.8	138,000	22.0	104,000	13.7	42,800	12.9	38,000	11.1	27,900
7	26.7	147,000	25.9	139,000	21.8	103,000	13.6	42,200	12.9	38,000	11.1	27,900
8	26.8	148,000	25.9	139,000	21.4	99,200	13.5	41,600	12.9	38,000	11.1	27,900
9	26.8	148,000	25.9	139,000	21.0	96,000	13.4	41,000	12.9	38,000	11.1	27,900
10	26.8	148,000	25.8	138,000	20.6	92,800	13.3	40,400	12.8	37,400	11.0	27,400
11	26.9	149,000	25.7	137,000	20.0	88,000	13.2	39,800	12.8	37,400	10.9	26,900
12	26.9	149,000	25.6	136,000	19.6	84,800	13.1	39,200	12.7	36,900	10.8	26,300
13	26.8	148,000	25.5	135,000	19.0	80,000	13.0	38,600	12.7	36,900	10.8	26,300
14	26.6	146,000	25.4	134,000	18.6	76,800	12.9	38,000	12.6	36,300	10.7	25,800
15	26.5	145,000	25.3	133,000	18.2	73,600	12.8	37,400	12.6	36,300	10.7	25,800
16	26.4	144,000	25.2	132,000	17.6	69,100	12.7	36,900	12.5	35,700	10.7	25,800
17	26.2	142,000	25.2	132,000	17.2	66,200	12.6	36,300	12.5	35,700	10.6	25,200
18	26.1	141,000	25.1	131,000	16.8	63,400	12.5	35,700	12.4	35,100	10.5	24,700
19	26.0	140,000	25.1	131,000	16.4	60,500	12.4	35,100	12.3	34,500	10.5	24,700
20	25.9	139,000	25.0	130,000	16.3	59,800	12.3	34,500	12.2	34,000	10.4	24,100
21	25.8	138,000	25.0	130,000	16.0	57,700	12.3	34,500	12.1	33,400	10.4	24,100
22	25.6	136,000	24.9	129,000	15.8	56,400	12.2	34,000	12.1	33,400	10.3	23,600
23	25.5	135,000	24.8	128,000	15.6	55,000	12.2	34,000	12.0	32,800	10.2	23,100
24	25.3	133,000	24.7	127,000	15.3	53,000	12.2	34,000	12.0	32,800	10.2	23,100
25	25.1	131,000	24.6	126,000	15.0	51,000	12.3	34,500	11.8	31,700	10.2	23,100
26	25.0	130,000	24.5	125,000	14.8	49,700	12.3	34,500	11.7	31,200	10.1	22,500
27	25.0	130,000	24.4	125,000	14.8	49,700	12.4	35,100	11.6	30,600	10.1	22,500
28	25.1	131,000	24.2	123,000	14.7	49,100	12.4	35,100	11.6	30,600	10.0	22,000
29	25.2	132,000	24.1	122,000	14.6	48,400	12.5	35,700	11.5	30,100	10.0	22,000
30	25.3	133,000	24.0	121,000	14.4	47,200	12.5	35,700	11.4	29,500	9.9	21,500
31	25.4	134,000	23.8	119,000	....	....	12.6	36,300			9.9	21,500

Monthly Discharge of Columbia River at Trail for 1915.

(Drainage area, 34,000 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	22,500	17,000	19,900	0.58	0.67	1,220,000
February	17,000	16,000	16,400	0.48	0.50	911,000
March	22,000	15,500	17,300	0.51	0.59	1,060,000
April	72,000	23,100	45,500	1.34	1.50	2,710,000
May	129,000	74,000	110,000	3.24	3.74	6,760,000
June	137,000	127,000	123,000	3.62	4.04	7,320,000
July	149,000	130,000	140,000	4.12	4.75	8,610,000
August	139,000	119,000	132,000	3.88	4.47	8,120,000
September	117,000	47,200	76,600	2.25	2.51	4,560,000
October	45,900	34,000	38,200	1.13	1.30	2,350,000
November	38,000	29,500	35,000	1.03	1.15	2,080,000
December	29,500	21,500	25,400	0.75	0.86	1,560,000
The year	149,000	15,500	64,900	1.91	26.08	47,261,000

DUNCAN RIVER.—(3066).

Location.—About 10 miles above the mouth, at the highway bridge, 1 mile south of Howser.

Records Available.—December 1914, and all of 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Considerable rainfall in spring and fall. Winters and summers temperate.

Gauge.—A vertical staff, nailed to the wharf at Howser, about 1 mile above measuring section. Daily readings made by Mr. Wm. Simpson.

Channel.—The section is situated about midway in a straight stretch of over 1,500 feet.

Discharge Measurements.—The rating curve was compiled from one measurement made in November, 1914, and four well-distributed measurements in 1915.

Accuracy.—"B" and "C." The readings are reliable. The section is good. Results should be within 10 and 15 per cent.

General.—The Duncan river rises in the Selkirk and Purcell mountains, and flows south through the Purcell trench into Kootenay lake. There is considerable timber along this river, and a number of promising but undeveloped mining properties. The stream is swift, but in portions is suitable for small boats.

Discharge Measurements of Duncan River at Howser.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
Nov. 27	Richardson & Beeston	1,941	280	1,700	0.74	1.80	1,250
1915							
Mar. 5	Beeston	1,929	271	1,440	0.33	0.78	477
May 5	Corbould	1,927	309	2,430	1.83	4.20	4,450
July 21	Dempster	1,927	320	2,930	2.49	6.20	7,240
Oct. 27	Dempster	1,927	283	1,740	0.81	2.05	1,410

Daily Gauge Height and Discharge of Duncan River at Howser for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.28	759	0.87	500	0.8	465	1.55	1,010	3.9	3,780	4.7	4,920
2	1.28	759	0.87	500	0.77	452	1.6	1,060	4.15	4,140	4.7	4,920
3	1.25	735	0.9	515	0.77	452	1.65	1,140	4.2	4,210	4.7	4,920
4	1.22	711	0.9	515	0.77	452	2.0	1,460	4.3	4,350	4.7	4,920
5	1.22	711	0.92	526	0.75	442	2.18	1,650	4.3	4,350	4.8	5,070
6	1.2	695	0.92	526	0.75	442	2.25	1,760	4.32	4,380	5.0	5,360
7	1.2	695	0.92	526	0.72	429	2.32	1,800	4.5	4,630	5.1	5,510
8	1.17	675	0.92	526	0.72	429	2.4	1,890	4.9	5,210	5.4	5,960
9	1.17	675	0.92	526	0.72	429	2.4	1,890	5.45	6,040	5.25	5,740
10	1.15	662	0.9	515	0.75	442	2.4	1,890	5.75	6,520	5.05	5,440
11	1.15	662	0.9	515	0.75	442	2.4	1,890	6.0	6,920	4.8	5,070
12	1.15	662	0.87	500	0.77	452	2.4	1,890	5.7	6,440	4.58	4,750
13	1.15	662	0.87	500	0.77	452	2.42	1,910	5.4	5,960	4.5	4,630
14	1.12	643	0.87	500	0.77	452	2.5	2,000	5.0	5,360	4.5	4,630
15	1.1	630	0.87	500	0.8	465	2.6	2,110	4.8	5,070	4.7	4,920
16	1.1	630	0.85	490	0.8	465	2.7	2,220	4.45	4,560	4.9	5,210
17	1.1	630	0.85	490	0.82	475	2.9	2,470	4.3	4,350	5.35	5,880
18	1.1	630	0.82	475	0.85	490	3.22	2,890	4.12	4,090	5.7	6,440
19	1.07	612	0.82	475	0.87	500	3.6	3,380	4.2	4,210	5.6	6,280
20	1.05	600	0.82	475	0.90	515	3.9	3,780	4.22	4,240	5.4	5,960
21	1.0	570	0.82	475	0.95	543	3.9	3,780	4.3	4,350	5.2	5,660
22	1.0	570	0.85	490	1.0	570	3.98	3,890	4.6	4,780	5.2	5,660
23	1.0	570	0.8	465	1.02	582	3.75	3,580	4.75	5,000	5.3	5,810
24	0.95	543	0.8	465	1.25	735	3.6	3,380	4.8	5,070	5.4	5,960
25	0.9	515	0.8	465	1.4	865	3.4	3,120	4.9	5,210	5.8	6,600
26	0.9	515	0.8	465	1.42	884	3.4	3,120	4.85	5,140	6.4	7,600
27	0.87	500	0.8	465	1.45	912	3.4	3,120	4.8	5,070	6.45	7,680
28	0.85	490	0.8	465	1.47	932	3.38	3,090	4.8	5,070	6.15	7,180
29	0.85	490	....	....	1.47	932	3.35	3,060	5.00	5,360	5.8	6,600
30	0.85	490	....	....	1.5	960	3.55	3,320	5.0	5,360	5.7	6,440
31	0.85	490	....	....	1.5	960	....	....	4.9	5,210	....	....

	July.		August.		September.		October.		November.		December.	
1	5.72	6,470	6.62	7,960	6.2	7,260	2.18	1,650	2.4	1,890	1.3	775
2	6.0	6,920	6.82	8,300	5.65	6,360	2.3	1,780	2.35	1,840	1.2	695
3	6.05	7,000	6.9	8,440	5.4	5,960	2.28	1,760	2.3	1,780	1.2	695
4	6.2	7,260	7.2	8,960	5.3	5,810	2.2	1,670	2.2	1,670	1.2	695
5	6.35	7,520	7.2	8,960	5.2	5,660	2.1	1,560	2.2	1,670	1.2	695
6	6.55	7,840	6.95	8,520	5.0	5,360	2.08	1,540	2.18	1,650	1.2	695
7	6.7	8,100	6.9	8,440	4.8	5,070	2.0	1,460	2.1	1,560	1.2	695
8	6.85	8,360	6.92	8,470	4.4	4,490	1.9	1,360	2.0	1,460	1.2	695
9	6.8	8,270	6.95	8,520	4.0	3,920	1.85	1,310	1.9	1,360	1.3	775
10	6.7	8,100	6.8	8,270	3.7	3,510	1.8	1,260	1.9	1,360	1.3	775
11	6.25	7,340	6.8	8,270	3.4	3,120	1.7	1,160	1.9	1,360	1.2	695
12	5.9	6,760	6.78	8,240	3.0	2,600	1.68	1,140	1.8	1,260	1.2	695
13	5.7	6,440	6.8	8,270	2.85	2,400	1.65	1,110	1.7	1,160	1.2	695
14	5.7	6,440	6.8	8,270	2.65	2,170	1.62	1,080	1.6	1,060	1.15	660
15	6.0	6,920	6.8	8,270	2.5	2,000	1.6	1,060	1.6	1,060	1.12	643
16	6.15	7,180	6.8	8,270	2.4	1,890	1.6	1,060	1.6	1,060	1.1	630
17	6.22	7,290	6.8	8,270	2.4	1,890	1.55	1,010	1.6	1,060	1.1	630
18	6.2	7,260	6.9	8,440	2.4	1,890	1.5	960	1.6	1,060	1.1	630
19	6.12	7,120	6.8	8,270	2.4	1,890	1.6	1,060	1.6	1,060	1.1	630
20	6.1	7,090	6.6	7,930	2.58	2,090	1.7	1,160	1.5	960	1.1	630
21	6.2	7,260	6.5	7,760	2.5	2,000	1.8	1,260	1.5	960	1.1	630
22	6.32	7,460	6.55	7,840	2.45	1,940	1.8	1,260	1.5	960	1.1	630
23	6.5	7,760	6.6	7,930	2.4	1,890	1.8	1,260	1.45	912	1.1	630
24	6.48	7,730	6.55	7,840	2.4	1,890	1.85	1,310	1.4	865	1.1	630
25	6.48	7,730	6.5	7,760	2.4	1,890	1.9	1,360	1.4	865	1.1	630
26	6.28	7,400	6.45	7,680	2.35	1,840	1.9	1,360	1.4	865	1.05	600
27	6.38	7,570	6.35	7,520	2.3	1,780	2.0	1,460	1.4	865	1.02	582
28	6.4	7,600	6.2	7,260	2.25	1,720	2.15	1,620	1.35	820	1.05	600
29	6.4	7,600	6.3	7,430	2.2	1,670	2.25	1,720	1.3	775	0.95	542
30	6.45	7,680	6.35	7,520	2.18	1,650	2.45	1,940	1.3	775	0.85	490
31	6.5	7,760	6.45	7,680	....	....	2.4	1,890	....	....	0.85	490

Monthly Discharge of Duncan River at Howser for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	759	490	619			38,100
February	526	465	495			27,500
March	960	429	581			35,700
April	3,890	1,010	2,450			146,000
May	6,920	3,780	4,980			306,000
June	7,680	4,630	5,720			340,000
July	8,360	6,440	7,390			454,000
August	8,960	7,260	8,110			499,000
September	7,260	1,650	3,120			186,000
October	1,940	960	1,370			84,200
November	1,890	775	1,200			71,400
December	775	490	651			40,000
The year	8,960	429	3,060			2,227,900

FRY CREEK.—(3070).

Location.—The section is located about ¾ mile above mouth of creek, and about ½ mile above canyon, about 2 miles from Johnston's Landing.

Records Available.—December 1914, and all of 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Summers are hot and generally dry in July and August; the winters are mild. The temperature seldom goes below zero. The snowfall is not heavy, but there is considerable rainfall in spring and fall. The creek freezes over during cold spells, but seldom for more than two weeks at a time. Frazil ice is a possibility.

Gauge.—The gauge is just below canyon, and is painted on a sloping rock. Mr. W. Holmgren reads the gauge weekly.

Channel.—Straight for about 200 feet above the cable station, and for 100 feet below. The bed is of broken rock formation. Current swift.

Discharge Measurements.—The 1915 data has been prepared from a rating curve based on five measurements during the year. These were, with one exception, made from cable car.

Accuracy.—This stream has its source near or in the summit of the Purcell mountains, and is subject to considerable variation. As gauge readings were only made once a week no accuracy can be given at present.

General.—Fry creek is the third largest tributary to Kootenay lake. It has its source about 20 miles from the mouth, in the summit of the Purcells. It is a mountain torrent, with extreme high flow in the summer months, and a very low flow in winter. There are good power possibilities at the canyon, particularly for 9 months of the year. Placer mining has been carried on for several years, and it is contended that there is still gold in the bed.

Discharge Measurements of Fry Creek at Johnston's Landing for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 23	Richardson & Elliott	1,900	76.0	123.0	1.47	0.60	179[1]
April 1	Elliott	1,909	74.0	185.0	1.03	0.60	193[2]
May 10	Corbould	1,909	90.0	455.0	5.03	5.47	2,280
July 24	Dempster	1,927	94.0	455.0	4.37	5.05	1,990
Oct. 29	Dempster	1,927	74.5	250.0	1.89	2.28	484

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[1] At wading section. [2] At cable section.

Daily Gauge Height and Discharge of Fry Creek at Johnston's Landing for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.60	186	4.70	1,640	....	1,530	....	2,580	....	1,760	....	1,280
2	....	240	....	1,820	4.40	1,520	....	2,530	....	1,720	....	1,270
3	1.40	295	....	2,000	....	1,540	5.70	2,480	....	1,680	....	1,250
4	....	291	....	2,180	....	1,670	....	2,680	4.70	1,640	4.10	1,230
5	....	286	....	2,360	4.90	1,800	....	2,820	....	1,610	....	1,100
6	....	282	....	2,540	....	1,750	6.30	3,000	....	1,590	....	970
7	....	277	....	2,720	....	1,690	....	2,720	4.60	1,560	....	839
8	....	273	6.20	2,910	....	1,640	....	2,440	....	1,570	....	708
9	....	268	....	2,610	....	1,580	....	2,160	....	1,580	....	576
10	1.20	263	5.50	2,310	....	1,520	5.00	1,880	....	1,590	....	444
11	....	401	....	2,150	....	1,470	....	1,880	....	1,600	1.50	312
12	....	539	....	1,980	4.40	1,420	....	1,880	....	1,610	....	288
13	....	677	....	1,820	....	1,530	....	1,880	....	1,620	1.20	263
14	....	815	....	1,650	....	1,640	....	1,880	4.70	1,640	....	280
15	....	953	4.50	1,490	....	1,760	....	1,880	....	1,660	....	297
16	....	1,090	....	1,500	5.00	1,880	....	1,880	....	1,690	....	315
17	4.10	1,230	....	1,510	....	1,820	5.00	1,880	4.80	1,720	....	332
18	....	1,180	....	1,520	....	1,770	....	2,020	....	1,760	1.70	349
19	....	1,140	....	1,530	4.80	1,720	....	2,150	....	1,800	....	337
20	....	1,090	....	1,540	....	1,880	....	2,290	....	1,840	....	325
21	....	1,050	....	1,550	....	2,030	....	2,420	5.00	1,880	....	312
22	....	1,000	4.60	1,560	....	2,190	5.80	2,560	....	1,800	....	300
23	....	960	....	1,610	....	2,350	....	2,300	....	1,720	....	287
24	3.50	910	....	1,650	....	2,510	5.20	2,050	....	1,640	....	275
25	....	1,010	....	1,700	....	2,670	....	2,010	4.60	1,560	1.20	263
26	....	1,110	....	1,740	6.10	2,830	....	1,980	....	1,490	....	272
27	....	1,220	....	1,790	....	2,780	....	1,940	....	1,420	....	282
28	....	1,320	....	1,840	....	2,730	....	1,910	4.30	1,350	....	291
29	....	1,420	5.00	1,880	....	2,680	....	1,880	....	1,330	....	301
30	....	1,530	....	1,760	....	2,630	....	1,840	....	1,310	....	310
31	....	....	....	1,640	....	....	4.90	1,800	....	1,300	....	....

	October.		November.		December.	
1	....	320	....	427	....	156
2	1.60	330	....	397	....	160
3	....	318	....	368	....	164
4	....	306	....	338	0.40	168
5	....	295	....	308	....	167
6	....	283	1.30	278	....	166
7	....	272	....	263	....	165
8	....	260	....	248	....	164
9	1.10	248	....	234	....	163
10	....	243	....	219	....	162
11	....	238	....	205	0.30	161
12	1.00	234	....	190	....	160
13	....	228	0.50	175	....	159
14	....	222	....	176	....	158
15	....	216	....	178	....	157
16	0.80	210	....	179	....	156
17	....	218	....	180	....	155
18	....	227	....	182	0.20	154
19	....	235	....	184	....	153
20	....	244	0.60	186	....	152
21	....	252	....	179	....	151
22	....	261	....	173	....	150
23	....	269	....	166	....	149
24	1.30	278	....	160	....	148
25	....	313	....	154	0.10	147
26	....	348	....	147	....	146
27	....	382	0.00	140	....	145
28	....	417	....	144	....	144
29	....	451	....	148	....	143
30	2.30	486	....	152	....	142
31	....	456	....	....	....	141

Monthly Discharge of Fry Creek at Johnston's Landing for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,530	186	777	....	....	46,200
May	2,910	1,490	1,890	....	....	116,000
June	2,830	1,420	1,950	....	....	116,000
July	3,000	1,800	2,180	....	....	134,000
August	1,880	1,300	1,610	....	....	99,000
September	1,280	263	522	....	....	31,100
October	486	210	292	....	....	18,000
November	427	140	216	....	....	12,900
December	168	141	155	....	....	9,530
The period	3,000	140	1,065	....	....	582,730

GLACIER CREEK.—(3071).

Location.—At footbridge, about 1 mile above the mouth, and about 2 miles south-east of Howser.

Records Available.—June to November, 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Considerable rainfall in spring and fall. Winters and summers temperate. It is probable that at the source in the higher altitudes the precipitation is heavy.

Gauge.—A vertical staff read three times a week by Mr. C. Malloch.

Channel.—Very swift water, running over a bed of boulders.

Discharge Measurements.—A measurement was made in November 1914; and three in 1915, and on these the present data has been based.

Accuracy.—"D." This stream is a mountain torrent. At low water it is difficult to get measurements with precision. At high water it is practically impossible. Hence the accuracy will not be guaranteed but is thought to be within 20 per cent.

General.—Glacier creek rises in the Purcell mountains, flows westerly, and empties into the Duncan river about 2 miles below Howser. It is only about 12 miles in length but it carries considerable water, especially during June, July, August and September. There are timber resources, and a number of promising mineral claims in this vicinity.

Discharge Measurements of Glacier Creek at Howser for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
Nov. 27	Richardson & Beeston	1,929	38.0	85.6	1.66	4.30	142[1]
1915							
May 5	Corbould	1,927	36.0	119.0	2.60	1.80	309[2]
July 21	Dempster	1,927	37.0	155.0	8.25	3.60	1,280[2]
Oct. 27	Dempster	1,927	27.5	76.2	2.56	1.65	195[2]

[1] Old gauge.
[2] New gauge.
Relationship.—New gauge = 0.0, old gauge = 3.25.

Daily Gauge Height and Discharge of Glacier Creek at Howser for 1915.

Day.	June.		July.		August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec. ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.3	452	3.65	1,320	....	2,320	3.4	1,110	1.9	305	....	195
2	....	435	....	1,490	4.7	2,480	3.8	1,460	....	270	1.45	190
3	2.22	419	4.0	1,660	....	2,360	4.0	1,660	1.65	235	....	184
4	2.8	702	4.1	1,770	4.5	2,240	....	1,410	....	229	1.4	179
5	2.7	646	4.1	1,770	....	2,320	....	1,160	1.6	223	....	174
6	....	735	....	1,770	....	2,400	....	910	1.5	200	1.35	170
7	3.0	824	4.1	1,770	4.7	2,480	....	660	....	194	1.3	160
8	2.75	694	3.8	1,460	....	2,420	2.2	411	....	189	....	160
9	....	563	....	1,280	4.6	2,360	....	366	....	184	....	160
10	2.25	432	3.4	1,110	....	2,360	1.95	321	1.4	179	1.3	160
11	....	487	....	962	4.6	2,360	....	296	....	179	....	150
12	2.5	543	3.0	824	....	2,480	....	272	1.4	179	....	140
13	....	652	....	927	....	2,600	1.7	248	1.35	170	1.1	130
14	2.9	761	3.3	1,030	4.9	2,720	....	261	....	165	....	140
15	3.2	960	....	1,070	....	2,600	1.8	275	1.3	160	....	150
16	3.3	1,030	3.4	1,110	4.7	2,480	1.8	275	....	165	1.3	160
17	3.4	1,110	....	1,220	....	2,240	1.8	275	1.35	170	....	156
18	3.2	960	....	1,340	4.3	2,000	....	306	....	180	1.25	152
19	....	831	3.8	1,460	....	1,940	2.0	338	1.45	190	....	148
20	2.8	702	....	1,370	4.2	1,880	....	327	....	195	1.2	144
21	....	796	3.6	1,280	....	2,180	....	316	1.5	200	....	144
22	3.1	890	....	1,520	4.7	2,480	1.9	305	....	195	1.2	144
23	....	1,270	4.1	1,770	3.6	1,280	....	295	1.45	190	1.2	144
24	4.0	1,660	....	1,770	4.6	2,360	....	285	....	190	....	144
25	....	1,470	....	1,770	....	2,480	1.8	275	1.45	190	1.2	144
26	3.6	1,280	4.1	1,770	4.8	2,600	....	275	....	206	....	140
27	3.3	1,030	....	1,770	....	2,540	1.8	275	1.6	223	1.15	137
28	3.0	824	4.1	1,770	4.7	2,480	1.7	248	....	223	....	139
29	3.4	1,110	....	1,880	4.6	2,360	....	267	1.6	223	....	141
30	....	1,210	4.3	2,000	....	1,820	....	286	....	211	1.2	144
31	.....	....	....	2,160	3.6	1,280	....	....	1.5	200	....	....

Monthly Discharge of Glacier Creek at Howser for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	1,660	419	849	...	...	...
July	2,160	824	1,490	...	...	...
August	2,720	1,280	2,290		...	
September	1,660	248	506	...	...	
October	305	160	200	...	...	
November	195	130	154	...		
The period	2,720	130	914			..

GOAT RIVER.—(3031).

Location.—Immediately above bridge, near Erickson, 5 miles from Creston.

Records Available.—1914 and 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Similar to Nelson. (See Kootenay river, Nelson.) The river generally freezes over, but only for two or three weeks at a time, frazil ice is to be expected.

Gauge.—A vertical staff, located immediately above head of canyon, 20 yards from Canyon siding. The control is permanent.

Channel.—At the gauge it is permanent, but is liable to shift below the measuring section.

Discharge Measurements.—The 1915 data is based on seven well-distributed measurements in 1914, and four in 1915. An ice measurement on February 19, 1915, gave a discharge of 167 c.f.s.

Accuracy.—"A" and "B." Daily readings have been obtained, and good measurements were made. Results should be within 5 and 10 per cent.

Discharge Measurements of Goat River at Erickson.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 8	Richardson & Beeston	1,672	99.0	549	4.55	3.00	2,500
May 28	Elliott	1,909	99.0	589	5.00	3.50	2,940
June 18	Richardson	1,672	103.0	711	6.02	4.95	4,280
July 21	Gill	1,929	87.0	399	1.84	0.00	735
Aug. 4	Gill	1,929	79.0	350	0.99	-1.10	348
Oct. 18	Gill	1,929	96.0	421	1.25	1.71	527
Dec. 21	Elliott & Corbould	1,909	32.0	229	1.14	-1.20	261
1915							
Feb. 19	Elliott & Corbould	1,927	75.0	344	0.49	-1.65	167
April 15	Corbould & Beeston	1,927	101.0	534	3.64	2.30	1,950[1]
April 30	Beeston	1,929	104.0	565	4.30	4.82	2,430
Nov. 25	Dempster	1,927	90.0	367	0.75	0.80	277

[1] 1915 gauge established with relation to the old gauge.

Daily Gauge Height and Discharge of Goat River at Erickson for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	0.7	256	0.7	256	2.5	855	4.85	2,420	4.7	2,290
2	....	....	0.7	256	0.7	256	2.9	1,050	4.55	2,160	4.45	2,080
3	....	....	0.7	256	0.9	292	3.05	1,120	4.45	2,080	4.3	1,950
4	....	....	0.7	256	0.9	292	....	1,150	4.3	1,950	3.85	1,620
5	....	....	0.7	256	0.9	292	3.15	1,180	4.4	2,040	3.8	1,580
6	....	....	0.7	256	0.9	292	3.15	1,180	4.5	2,120	3.8	1,580
7	....	....	0.7	256	0.9	292	3.05	1,120	4.7	2,290	3.7	1,510
8	....	....	0.7	256	1.0	316	2.97	1,080	4.7	2,290	3.6	1,450
9	....	....	0.7	256	1.0	316	2.88	1,040	4.75	2,340	3.5	1,390
10	....	....	0.7	256	1.0	316	2.97	1,080	5.0	2,570	4.1	1,800
11	....	....	0.7	256	1.0	316	3.5	1.390	4.9	2,470	3.75	1,540
12	....	....	0.7	256	1.2	368	3.8	1,580	4.85	2,420	....	1,340
13	....	....	0.7	256	1.2	368	4.0	1,720	4.4	2,040	3.1	1,150
14	....	....	0.7	256	....	384	4.15	1,840	4.6	2,210	2.9	1,050
15	....	....	0.7	256	1.3	399	4.3	1,950	4.85	2,420	3.0	1,100
16	....	....	0.7	256	1.3	399	4.35	2,000	4.65	2,250	2.85	1,020
17	0.9	....	0.7	256	1.35	416	4.85	2,420	4.5	2,120	2.7	948
18	0.9	....	0.7	256	1.5	467	5.5	3.070	4.4	2,040	2.75	972
19	0.9	....	0.7	256	1.55	484	5.65	3.230	....	2,040	2.85	1,020
20	0.9	....	0.7	256	1.7	539	5.6	3,180	4.4	2,040	2.7	948
21	0.9	....	0.7	256	1.85	595	5.1	2,670	4.7	2,290	2.75	972
22	0.9	....	0.7	256	2.3	772	4.65	2,250	4.65	2,250	2.75	972
23	0.9	....	0.7	256	2.55	878	4.45	2,080	4.6	2,210	2.85	1,020
24	0.9	....	0.8	272	2.7	948	4.36	2,000	4.7	2,290	2.95	1,080
25	0.9	....	0.8	272	2.6	900	4.35	2,000	4.15	1,840	3.0	1,100
26	0.8	....	0.7	256	2.5	855	3.9	1,650	4.5	2,120	3.6	1,450
27	0.8	....	0.7	256	....	734	4.0	1,720	4.5	2,120	3.55	1,420
28	0.8	....	0.7	256	1.9	614	3.95	1,680	5.2	2,760	3.5	1.390
29	0.8	....	....	....	1.9	614	3.95	1,680	5.1	2,670	3.35	1,300
30	0.8	....	....	....	1.9	614	4.25	1,910	4.9	2,470	3.25	1,240
31	0.7	....	....	....	2.0	652	....	....	4.75	2.340	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	3.15	1,180	2.0	652	0.7	256	0.5	225	1.3	399	0.7	256
2	2.9	1,050	2.1	692	0.7	256	....	225	1.2	368	0.7	256
3	2.8	996	2.1	692	0.7	256	0.5	225	....	368	Ice	....
4	2.4	812	1.9	614	0.7	256	0.6	240	1.2	368	Ice	....
5	2.3	772	1.5	467	0.7	256	0.6	240	1.1	341	0.9	292
6	2.3	772	1.5	467	0.7	256	0.5	225	1.0	316	0.9	292
7	2.3	772	....	467	0.7	256	0.5	225	....	328	0.8	272
8	2.3	772	1.5	467	0.7	256	0.5	225	1.1	341	0.8	272
9	2.3	772	....	450	0.6	240	0.5	225	1.2	368	Ice	....
10	2.1	692	1.4	432	0.7	256	0.5	225	1.1	341	Ice	....
11	....	692	....	416	0.8	272	0.5	225	1.0	316	0.9	292
12	2.1	692	1.3	399	0.9	292	0.4	210	0.8	272	0.8	272
13	2.1	692	1.2	368	0.8	272	0.5	225	0.6	240	0.7	256
14	2.1	692	1.2	368	0.8	272	0.5	225	1.0	316	Ice	....
15	2.2	732	1.3	399	0.7	256	0.6	240	1.0	316	Ice	....
16	2.3	772	1.4	432	0.7	256	0.6	240	0.9	292	0.7	256
17	2.3	772	1.2	368	0.7	256	....	232	....	282	0.6	240
18	2.4	812	1.1	341	0.6	240	0.5	225	0.8	272	0.7	256
19	2.4	812	1.0	316	0.6	240	1.2	368	0.8	272	Ice	...
20	2.4	812	1.1	341	0.7	256	1.1	341	0.8	272	Ice	...
21	2.3	772	1.1	341	0.7	256	1.1	341	0.8	272	Ice	
22	2.3	772	1.0	316	0.8	272	0.9	292	0.8	272	Ice	
23	2.0	652	0.9	292	0.7	256	0.8	272	0.8	272	Ice	
24	1.8	576	0.9	292	0.6	240	0.8	272	0.8	272	Ice	
25	1.8	576	0.9	292	0.6	240	0.7	256	0.6	240	Ice	
26	1.7	539	0.8	272	0.6	240	1.0	316	0.5	225	0.6	240
27	3.1	1,150	0.8	272	0.7	256	1.1	341	....	225	0.5	225
28	2.7	948	0.7	256	0.7	256	1.1	341	0.5	225	0.4	210
29	2.4	812	0.7	256	0.5	225	..	354	0.5	225	0.4	210
30	2.1	692	0.6	240	0.5	225	1.2	368	0.6	240	0.4	210
31	2.1	692	0.7	256	....	....	1.4	432			Ice	

Monthly Discharge of Goat River at Erickson for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
February	272	256	257	....	....	14,300
March	948	256	491	....	....	30,200
April	3,230	855	1,760	....	....	105,000
May	2,760	1,840	2,250	....	....	138,000
June	2,290	948	1,340	....	....	79,700
July	1,180	539	782	....	....	48,100
August	692	240	395	....	....	24,300
September	292	225	254	....	....	15,100
October	432	210	271	....	....	16,700
November	399	225	295	....	....	17,600
The period	3,230	210	809.5	....	....	489,000

INONOAKLIN CREEK.—(3084).

Location.—At second highway bridge, about 2 miles from mouth, in the vicinity of Edgewood.

Records Available.—June to December, 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Considerable rainfall during spring and fall. Winters and summers temperate.

Gauge.—A vertical staff, attached to buttress just above the measuring section, was read daily by Mr. W. R. Colegrave.

Channel.—At the section the water has an even flow with a control about 100 yards below, which appears more or less permanent.

Discharge Measurements.—Four well distributed measurements were obtained, and on these the rating curve has been based.

Accuracy.—"A" and "B." Gauge readings and measurements are reliable, the results should be within 5 and 10 per cent.

General.—Inonoaklin creek is about 20 miles long, and drains the Fire valley which is fairly well settled and has great agricultural possibilities. The creek empties into the Lower Arrow lake, near Edgewood, and is important as a possible source of water supply and power. About half a mile from the mouth a drop of 30 feet or more occurs.

Discharge Measurements of Inonoaklin Creek at Edgewood for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
May 29	Richardson	1,909	52.0	224	3.61	3.30	808.0
June 24	Dempster	1,927	52.0	132	2.01	1.30	265.0
Sept. 16	Dempster	1,927	45.0	69.1	0.78	0.29	53.9
Oct. 21	Dempster	1,927	44.0	60.7	0.67	0.09	40.8

Daily Gauge Height and Discharge of Inonoaklin Creek at Edgewood for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	....	2.80	665	1.70	366	1.10	218	0.25	56.0
2	....	....	....	....	2.35	540	1.55	327	1.10	218	0.20	50.0
3	....	....	....	....	2.20	499	1.45	301	1.00	195	0.25	56.0
4	....	....	....	....	2.10	472	1.40	288	1.10	218	0.20	50.0
5	....	....	....	....	2.15	486	1.45	301	0.90	172	0.20	50.0
6	....	....	....	....	2.15	486	1.58	335	0.85	161	0.20	50.0
7	....	....	....	....	2.65	623	1.60	340	0.80	151	0.20	50.0
8	....	....	....	....	1.90	418	1.40	288	0.70	130	0.15	44.6
9	....	....	....	....	1.70	366	1.95	432	0.70	130	0.15	44.6
10	....	....	....	....	1.60	340	1.90	418	0.70	130	0.15	44.6
11	....	....	....	....	1.50	314	1.70	366	0.60	110	0.15	44.6
12	....	....	....	....	1.40	288	1.60	340	0.55	101	0.15	44.6
13	....	....	....	....	1.50	314	2.10	472	0.50	92	0.10	39.6
14	....	....	....	....	1.45	301	1.90	418	0.50	92	0.10	39.6
15	....	....	....	....	1.65	353	2.02	450	0.45	84	0.20	50.0
16	....	....	....	....	1.50	314	2.50	581	0.40	76	0.30	62.0
17	....	....	....	....	1.45	301	2.35	540	0.40	76	0.25	56.0
18	....	....	....	....	1.40	288	2.20	499	0.50	92	0.20	50.0
19	....	....	....	....	1.45	301	2.10	472	0.50	92	0.15	44.6
20	....	....	....	....	1.80	392	1.90	418	0.45	84	0.15	44.6
21	....	....	....	....	1.65	353	1.70	366	0.40	76	0.10	39.6
22	....	....	....	....	1.50	314	1.65	353	0.35	69	0.10	39.6
23	....	....	....	....	1.40	288	1.50	314	0.35	69	0.10	39.6
24	....	....	....	....	1.35	276	1.40	288	0.30	62	0.10	39.6
25	....	....	....	....	1.35	276	1.30	264	0.30	62	0.10	39.6
26	....	....	....	....	1.78	387	1.40	288	0.30	62	0.10	39.6
27	....	....	....	....	2.45	567	1.50	314	0.30	62	0.05	35.4
28	....	....	....	....	2.25	512	1.55	327	0.25	56	0.05	35.4
29	....	....	....	....	2.10	472	1.40	288	0.25	56	0.05	35.4
30	....	....	2.8	665	2.00	445	1.20	240	0.25	56	0.05	35.4
31	....	....	2.6	609	....	....	1.25	252	0.20	50	....	....

Day.	October.		November.		December.	
1	0.15	44.6	0.15	44.6	0.10	39.6
2	0.10	39.6	0.15	44.6	0.10	39.6
3	0.10	39.6	0.20	50.0	0.05	35.4
4	0.05	35.4	0.20	50.0	0.00	31.2
5	0.05	35.4	0.20	50.0	0.00	31.2
6	0.05	35.4	0.20	50.0	0.00	31.2
7	0.00	31.2	0.15	44.6	0.10	39.6
8	0.00	31.2	0.15	44.6	0.05	35.4
9	0.00	31.2	0.10	39.6	Ice	....
10	0.05	35.4	0.10	39.6	Ice	....
11	0.05	35.4	0.10	39.6	Ice	....
12	0.05	35.4	0.15	44.6	Ice	....
13	0.05	35.4	0.15	44.6	Ice	....
14	0.10	39.6	....	42.1	Ice	....
15	0.10	39.6	0.10	39.6	Ice	....
16	0.10	39.6	0.10	39.6	Frozen	....
17	0.05	35.4	0.15	44.6	Frozen	
18	0.00	31.2	0.15	44.6	Frozen	
19	0.05	35.4	0.10	39.6	Frozen	
20	0.10	39.6	0.10	39.6	Frozen	
21	0.10	39.6	0.10	39.6	Frozen	
22	0.10	39.6	0.10	39.6	Frozen	
23	0.10	39.6	0.15	44.6	Frozen	
24	0.20	50.0	0.20	50.0	Frozen	
25	0.20	50.0	0.15	44.6	Frozen	
26	0.20	50.0	0.10	39.6	Frozen	
27	0.20	50.0	0.05	35.4	Frozen	
28	0.25	56.0	....	38.4	Frozen	
29	0.20	50.0	....	41.5	Frozen	
30	0.20	50.0	0.15	44.6	Frozen	
31	0.15	44.6	....	....	Frozen	

Monthly Discharge of Inonoaklin Creek near Edgewood for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
June	665	276	398.0	....	....	23,700
July	581	240	363.0	....	....	22,300
August	218	50	107.0	....	....	6,580
September	62.0	35.4	45.0	....	....	2,680
October	56.0	31.2	40.2	....	....	2,470
November	50.0	35.4	43.1	....	....	2,560
The period	665	31.2	166.0	....	....	60,290

KASLO CREEK.—(3029).

Location.—The section is at the second highway bridge above the mouth, in Kaslo.

Records Available.—1914 and 1915.

Drainage Area.—One hundred and seventy square miles.

Climatic Conditions.—The summers are hot and generally dry in July and August; the winters are mild. The temperature seldom goes below zero. The snowfall is not heavy, but there is considerable rainfall in spring and fall. The creek freezes over during cold spells, but seldom for more than two weeks at a time. Frazil ice is a possibility.

Gauge.—Chain gauge is read daily by Mr. W. F. Hurst, of Kaslo.

Channel.—The bed of the stream is broken, with boulders, but is apparently permanent. The water flows swiftly, and at an angle to the section.

Discharge Measurements.—The 1915 data is prepared from a rating curve based on five measurements taken in 1914 and four in 1915.

Accuracy.—"C" and "D." Daily readings were obtained and the curve is fair. Results should be within 15 per cent.

Discharge Measurements of Kaslo Creek at Kaslo (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 23	Elliott	1,672	64.0	282	7.11	2.90	2,000
June 17	Richardson	1,672	73.0	349	9.35	3.75	3,270
July 22	Richardson	1,672	65.9	191	3.86	1.95	737
Sept. 23	Elliott	1,929	62.9	131	2.70	1.25	354
Nov. 30	Richardson & Beeston	1,929	63.0	96	2.04	0.85	195
1915							
Mar. 3	Beeston	1,929	56.0	82.4	1.22	0.40	101
May 10	Corbould	1,909	73.0	266	6.57	2.80	1,750
July 25	Dempster	1,927	66.0	192	4.04	2.00	776
Nov. 10	Beeston	1,927	64.0	130	2.17	0.95	282

Daily Gauge Height and Discharge of Kaslo Creek at Kaslo for 1915.

(Drainage area, 170 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.58	134	Ice	....	0.40	100	0.98	247	2.30	1,080	2.48	1,300
2	0.60	138	Ice	....	0.40	100	1.15	310	2.32	1,100	2.48	1,300
3	0.57	132	Ice	....	0.38	96	1.58	507	2.22	989	2.40	1,200
4	0.50	118	Ice	....	0.45	109	1.55	491	2.20	966	2.45	1,260
5	0.50	118	Ice	....	0.42	104	1.50	465	2.18	946	2.60	1,470
6	0.57	132	Ice	....	0.42	104	1.48	456	2.25	1,020	2.56	1,410
7	0.47	113	0.40	100	0.45	109	1.45	442	2.52	1,360	2.82	1,790
8	0.60	138	0.35	91	0.40	100	1.40	418	2.75	1,680	2.58	1,440
9	0.55	128	0.40	100	0.30	82	1.30	374	2.82	1,790	2.45	1,260
10	0.55	128	0.35	91	0.37	94	1.30	374	2.80	1,760	2.28	1,060
11	0.52	122	0.35	91	0.42	104	1.38	410	2.52	1,360	2.25	1,020
12	0.53	124	0.45	109	0.42	104	1.40	418	2.32	1,100	2.25	1,020
13	0.50	118	0.40	100	0.42	104	1.60	517	2.25	1,020	2.30	1,080
14	0.57	132	0.37	94	0.52	122	1.60	517	2.38	1,180	2.48	1,300
15	0.50	118	0.50	118	0.58	134	1.55	491	2.45	1,260	2.65	1,540
16	0.50	118	0.40	100	0.60	138	1.80	628	2.25	1,020	2.65	1,540
17	0.50	118	0.40	100	0.65	150	2.00	772	2.22	989	2.62	1,500
18	0.40	100	0.50	118	0.77	182	2.30	1,080	2.30	1,080	2.55	1,400
19	0.47	113	0.42	104	0.65	150	2.40	1,200	2.35	1,140	2.40	1,200
20	0.43	105	0.27	77	0.85	150	2.45	1,260	2.35	1,140	2.30	1,080
21	0.37	94	0.32	86	0.82	196	2.25	1,020	2.48	1,300	2.35	1,140
22	0.40	100	0.33	87	0.97	244	2.00	772	2.55	1,400	2.38	1,180
23	....	Ice	0.35	91	1.08	283	1.92	708	2.52	1,360	2.45	1,260
24	....	Ice	0.32	86	1.12	298	1.85	660	....	1,340	2.52	1,360
25	....	Ice	0.30	82	1.08	283	1.80	628	2.50	1,330	2.62	1,500
26	....	Ice	0.40	100	0.93	230	1.85	660	2.42	1,230	2.68	1,580
27	....	Ice	0.40	100	0.88	214	2.00	772	2.42	1,230	2.40	1,200
28	....	Ice	0.40	100	0.90	220	1.85	660	2.85	1,840	2.35	1,140
29	....	Ice	....	....	0.88	214	2.05	818	2.90	1,910	2.40	1,200
30	....	Ice	....	....	0.88	214	2.45	1,260	2.52	1,360	2.50	1,330
31	....	Ice	....	....	0.90	220	....	....	2.40	1,200	....	....

	July.		August.		September.		October.		November.		December.	
1	2.63	1,510	2.05	818	1.32	383	0.90	220	1.20	330	0.75	176
2	2.58	1,440	2.02	790	1.20	330	1.20	330	1.20	330	0.75	176
3	2.62	1,500	2.05	818	1.18	322	1.10	290	1.10	290	0.70	162
4	2.50	1,330	1.98	756	1.18	322	1.00	254	1.10	290	0.72	168
5	2.58	1,440	1.82	641	1.25	352	1.08	283	1.05	272	0.72	168
6	2.55	1,400	1.82	641	1.25	352	1.00	254	0.98	247	0.70	162
7	2.58	1,440	1.82	641	1.22	339	0.92	227	0.95	237	0.70	162
8	2.45	1,260	1.78	615	1.18	322	0.92	227	0.98	247	0.72	168
9	2.38	1,180	1.75	600	1.02	261	0.92	227	0.95	237	0.85	205
10	2.25	1,020	1.68	561	1.18	322	0.98	247	0.95	237	0.72	168
11	2.15	915	1.70	572	1.05	272	0.90	220	0.95	237	0.68	157
12	2.00	772	1.72	583	1.02	261	0.92	227	0.92	227	0.70	162
13	2.15	915	1.65	544	0.95	237	0.88	214	0.90	220	0.70	162
14	2.15	915	1.60	517	0.90	220	0.90	220	0.95	237	0.68	157
15	2.25	1,020	1.65	544	0.98	247	0.88	214	0.98	247	0.68	157
16	2.40	1,200	1.62	528	1.05	272	0.88	214	0.98	247	0.70	162
17	2.45	1,260	1.65	544	1.05	272	0.80	190	0.92	227	0.68	157
18	2.45	1,260	1.65	544	1.10	290	0.88	214	0.90	220	0.70	162
19	2.35	1,140	1.60	517	1.12	298	1.02	261	0.88	214	0.65	150
20	2.32	1,100	1.95	732	1.02	261	1.00	254	0.88	214	0.65	150
21	2.35	1,140	1.80	628	1.00	254	0.95	237	0.88	214	0.68	157
22	2.32	1,100	1.65	544	1.05	272	0.95	237	0.88	214	0.68	157
23	2.30	1,080	1.62	528	1.02	261	0.98	247	0.85	205	0.62	143
24	2.22	989	1.58	507	1.15	310	1.05	272	0.85	205	0.62	143
25	2.08	846	1.55	491	1.05	272	1.12	298	0.88	214	0.60	138
26	2.10	864	1.48	456	1.00	254	1.12	298	0.82	196	0.60	138
27	2.35	1,140	1.42	427	1.05	272	1.30	330	0.78	184	0.60	138
28	2.18	946	1.45	442	1.02	261	1.25	352	0.68	157	0.62	143
29	2.05	818	1.48	456	0.95	237	1.38	410	0.75	176	0.68	157
30	1.98	756	1.55	491	0.92	227	1.28	365	0.70	162	Ice	138
31	2.10	864	1.50	465	....	....	1.22	339			Ice	138

Monthly Discharge of Kaslo Creek at Kaslo for 1915.

(Drainage area, 170 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March.	298	82	160	0.94	1.08	9,840
April...	1,260	247	645	3.79	4.23	38,400
May...	1,910	946	1,270	7.47	8.61	78,100
June.	1,790	1,020	1,300	7.64	8.52	77,400
July...	1,510	756	1,110	6.53	7.53	68,200
August..	818	427	579	3.41	3.93	35,600
September.	383	220	285	1.68	1.87	17,000
October...	410	190	264	1.55	1.79	16,200
November.	330	157	231	1.36	1.52	13,700
December...	205	138	157	0.92	1.06	9,650
The period...	1,910	82	600	3.53	40.14	364,090

KOOSKANAX CREEK.—(3022).

Location.—At bridge, above canyon, 1 mile from Nakusp, and about 1 mile from the mouth.

Records Available.—May to December, 1914, and practically all of 1915.

Drainage Area.—One hundred and twenty-five square miles.

Climatic Conditions.—Summers hot and fairly dry. Winters are mild. Thermometer occasionally goes below zero, but the mean temperature of the winter months is probably 25 degrees to 35 degrees Fahr. Frazil ice may be expected for a few days at a time only.

Gauge.—A chain gauge was installed and is read by Mr. J. H. Stevenson.

Channel.—The stream is confined between perpendicular walls, 38 feet apart, at the section. The control is a sand and gravel bar, which shifts considerably.

Discharge Measurements.—The 1915 rating curve is based on seven well-distributed measurements made during the year.

Accuracy.—"D." No gauge readings were made from May 6 to 25 inclusive, and other readings were only taken twice a week. The results are considered to be within 20 per cent.

Discharge Measurements of Kooskanax Creek at Nakusp for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 20	Beeston.....	1,929	27.4	209	0.55	0.50	115
May 17	Dempster......	1,929	28.0	221	3.36	2.60	747
May 27	Richardson...	1,909	27.0	250	4.50	3.00	1,120
June 22	Dempster....	1,927	26.0	265	2.92	2.25	774
Sept. 11	Dempster....	1,927	26.5	150	0.74	0.75	150
Nov 29	Beeston...	1,927	29.0	222	0.80	0.78	177

Daily Gauge Height and Discharge of Kooskanax Creek at Nakusp for 1915.

(Drainage area, 125 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	151	....	153	....	115	....	162	....	1,180	....	1,010
2	....	151	0.72	155	....	115	....	173	3.1	1,190	....	1,010
3	0.7	151	....	150	0.5	115	....	184	3.1	1,190	2.8	1,010
4	....	153	....	145	....	119	0.9	195	....	1,220	....	1,010
5	....	155	....	140	....	123	1.1	246	3.2	1,250	....	1,010
6	0.73	158	....	136	....	127	....	293	....	....	2.8	1,010
7	....	161	0.6	132	0.6	132	1.4	340	....	....	....	1,020
8	....	165	....	132	....	132	....	358	....	....	2.85	1,040
9	....	169	....	132	....	132	....	376	....	....	....	900
10	0.8	173	0.6	132	0.6	132	....	394	....	....	2.35	760
11	....	173	....	127	....	127	1.6	413	....	....	....	734
12	....	173	....	123	....	123	....	441	....	....	2.25	708
13	0.8	173	....	119	....	119	....	469	....	....	....	696
14	....	178	0.5	115	0.5	115	1.8	497	....	....	2.2	683
15	....	183	....	115	....	115	....	590	....	....	....	702
16	....	189	....	115	....	115	2.2	683	....	....	....	721
17	0.9	195	0.5	115	0.5	115	....	789	....	....	....	740
18	....	187	....	115	....	115	2.6	895	....	....	2.35	760
19	....	180	....	115	....	115	....	955	....	....	....	734
20	0.8	173	....	115	0.5	115	....	1,010	....	....	2.25	708
21	....	167	....	115	0.5	115	2.9	1,070	....	....	....	696
22	....	161	....	115	....	120	....	1,100	....	....	2.2	683
23	....	156	....	115	....	126	....	1,130	....	....	....	696
24	0.7	151	....	115	0.6	132	....	1,160	....	....	2.25	708
25	....	151	....	115	....	136	3.1	1,190	....	....	....	1,020
26	....	151	....	115	....	141	....	1,170	....	....	3.35	1,340
27	0.7	151	....	115	....	146	....	1,150	3.0	1,130	....	1,140
28	....	151	0.5	115	0.7	151	3.0	1,130	....	1,100	2.7	950
29	....	151	....	....	....	151	....	1,140	....	1,070	....	940
30	0.7	151	....	....	....	151	....	1,160	....	1,040	....	931
31	....	152	....	....	0.7	151	....	....	2.8	1,010	....	....

,	July.		August.		September.		October.		November.		December.	
1	2.65	922	....	329	....	151	....	168	....	397	....	152
2	....	854	....	318	0.7	151	0.9	195	....	368	0.65	142
3	2.4	787	1.3	307	....	151	....	187	1.4	340	....	146
4	....	752	....	291	0.7	151	....	180	....	357	0.70	151
5	....	717	1.2	276	....	151	0.8	173	1.5	375	....	148
6	2.2	683	....	268	0.7	151	....	167	1.3	307	....	145
7	....	635	1.15	261	....	151	0.75	162	....	291	0.65	142
8	2.0	387	....	251	....	151	....	162	1.2	276	....	152
9	....	563	....	241	0.7	151	0.75	162	....	266	0.75	162
10	1.9	540	1.05	232	....	151	....	162	....	256	....	152
11	....	587	....	219	0.7	151	....	162	1.1	246	0.65	142
12	....	635	0.95	207	....	154	0.75	162	....	215	....	142
13	2.2	683	....	201	....	158	....	184	0.85	184	....	142
14	....	761	0.9	195	0.75	162	0.95	207	....	195	0.65	142
15	2.5	840	....	191	....	174	....	184	....	207	....	137
16	....	955	....	187	0.85	184	0.75	162	1.0	219	0.60	132
17	2.9	1,070	0.85	184	....	184	....	190	....	213	....	132
18	....	928	....	178	0.85	184	....	218	0.95	207	....	132
19	2.4	787	0.8	173	....	176	1.1	246	....	199	0.60	132
20	....	736	....	190	....	169	....	253	....	191	....	137
21	....	685	0.95	207	0.75	162	1.15	261	0.85	184	0.65	142
22	2.1	634	....	195	....	156	....	261	....	184	....	142
23	....	587	....	184	0.7	151	1.15	261	0.85	184	0.65	142
24	1.9	540	0.8	173	....	151	....	271	....	178	....	137
25	....	518	....	173	0.7	151	....	281	0.8	173	0.60	132
26	....	497	0.8	173	....	148	1.25	291	....	173	Ice	130
27	1.75	476	....	167	....	145	....	352	0.8	173	Ice	130
28	....	435	0.75	162	0.65	142	1.6	413	....	169	Ice	130
29	1.55	394	....	156	....	142	....	434	....	165	Ice	130
30	....	367	0.7	151	0.65	142	1.7	455	0.75	162	Ice	130
31	1.4	340	....	151	....	....	....	420	....	....	Ice	130

Monthly Discharge of Kooskanax Creek at Nakusp for 1915.

(Drainage area, 125 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	195	151	164	1.31	1.51	10,100
February	155	115	125	1.00	1.04	6,940
March	151	115	127	1.01	1.16	7,810
April	1,190	162	695	5.56	6.20	41,400
June	1,340	683	869	6.95	7.75	51,700
July	1,070	340	661	5.29	6.10	40,600
August	329	151	213	1.70	1.96	13,100
September	184	142	156	1.25	1.39	9,280
October	455	162	238	1.90	2.19	14,600
November	397	162	235	1.88	2.10	140,000
December	162	130	140	1.12	1.29	8,610
The period	1,340	115	329	2.63	32.69	218,140

NOTE.—No gauge readings were taken from May 6 to May 25. As gauge readings were only made twice a week the accuracies cannot be guaranteed closer than 20%.

KOOTENAY RIVER.—(3075).

Location.—The gauge is located below the tail-race of the West Kootenay Power and Light Company's plant No. 2, at Upper Bonnington, 10 miles west of Nelson, and about 15 miles above the mouth of the Kootenay.

Records Available.—October, 1907, to October, 1915, through the courtesy of the above-mentioned company.

Drainage Area.—Seventeen thousand eight hundred square miles.

Climatic Conditions.—These are similar to Nelson (see Kootenay river. Nelson). The river never freezes over, and very little, if any, frazil ice is formed.

Gauge.—A vertical staff, below the tail-race, read daily by Mr. G. L. Thompson, of the West Kootenay Power and Light Company.

Method of Compilation.—The discharge curve is obtained by subtracting the discharge of Slocan river from the discharge of Kootenay river, near Glade.

Accuracy.—"B." Not guaranteed, owing to the difficulties with Slocan River curve, to be closer than 10 per cent.

Daily Gauge Height and Discharge of Kootenay River at Bonnington Falls for 1915.

(Drainage area, 17,800 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	121.1	8,560	120.4	7,520	120.2	7,260	121.6	9,390	131.4	35,800	134.7	49,900
2	121.7	9,560	120.3	7,390	120.1	7,130	121.9	9,920	131.5	36,200	134.6	49,500
3	121.8	9,740	120.3	7,390	120.2	7,260	122.2	10,500	131.8	37,300	134.6	49,500
4	121.7	9,560	120.3	7,390	120.2	7,260	122.3	10,600	132.0	38,100	134.6	49,500
5	121.7	9,560	120.3	7,390	120.2	7,260	122.7	11,400	132.2	38,900	134.6	49,500
6	121.8	9,740	120.3	7,390	120.1	7,130	123.2	12,400	132.3	39,300	134.7	49,900
7	121.7	9,560	120.3	7,390	120.1	7,130	123.2	12,400	132.6	40,500	134.6	49,500
8	121.7	9,560	120.4	7,520	120.2	7,260	123.4	12,900	132.8	41,400	134.6	49,500
9	121.4	9,050	120.5	7,660	120.1	7,130	123.6	13,300	133.0	42,200	134.6	49,500
10	121.6	9,390	120.3	7,390	120.1	7,130	123.8	13,700	133.3	43,500	134.6	49,500
11	121.5	9,220	120.4	7,520	120.1	7,130	123.9	13,900	133.6	44,800	134.6	49,500
12	121.5	9,220	120.3	7,390	120.3	7,390	124.2	14,600	133.8	45,700	134.5	49,000
13	121.5	9,220	120.2	7,260	120.2	7,260	124.4	15,000	....	46,100	134.4	48,500
14	121.3	8,880	120.0	7,000	120.3	7,390	124.6	15,500	134.0	46,600	134.3	48,100
15	121.3	8,880	120.3	7,390	120.1	7,130	126.0	18,800	134.2	47,600	134.2	47,600
16	121.2	8,720	120.3	7,390	120.2	7,260	125.3	17,100	134.2	47,600	134.1	47,100
17	121.3	8,880	120.3	7,390	120.1	7,130	126.0	18,800	134.4	48,500	134.0	46,600
18	121.2	8,720	120.2	7,260	120.1	7,130	126.5	20,100	134.3	48,100	133.9	46,200
19	121.2	8,720	120.2	7,260	120.2	7,260	127.2	22,000	134.5	49,000	133.8	45,700
20	120.8	8,090	120.2	7,260	120.2	7,260	128.0	24,200	134.4	48,500	133.8	45,700
21	120.9	8,240	120.3	7,390	120.3	7,390	128.5	25,700	134.3	48,100	133.9	46,200
22	120.8	8,090	120.3	7,390	120.5	7,660	129.0	27,300	134.4	48,500	133.8	45,700
23	120.8	8,090	120.2	7,260	120.5	7,660	129.8	30,000	134.2	47,600	133.8	45,700
24	120.8	8,090	120.3	7,390	120.8	8,090	130.0	30,700	134.2	47,600	133.9	46,200
25	120.7	7,940	120.3	7,390	121.0	8,400	130.3	31,800	134.2	47,600	133.8	45,700
26	120.5	7,660	120.2	7,260	121.2	8,720	130.3	31,800	134.3	48,100	133.8	45,700
27	120.5	7,660	120.2	7,260	121.0	8,400	130.5	32,500	134.3	48,100	133.9	46,200
28	120.4	7,520	120.3	7,390	121.3	8,880	130.8	33,600	134.4	48,500	134.0	46,600
29	120.5	7,660	....	....	121.3	8,880	131.0	34,300	134.4	48,500	134.2	47,600
30	120.5	7,660	....	....	121.3	8,880	131.1	34,700	134.5	49,000	134.5	49,000
31	120.6	7,800	....	....	121.5	9,220	....	....	134.7	49,900	....	....

	July.		August.		September.		October.		November.		December.	
1	134.5	49,000	133.5	44,400	129.5	29,000	....	15,300	123.8	13,700	122.6	11,200
2	134.5	49,000	133.4	44,000	129.2	28,000	....	15,000	123.7	13,500	122.6	11,200
3	134.6	49,500	133.4	44,000	129.2	28,000	124.4	15,000	123.7	13,500	122.4	10,800
4	134.7	49,900	133.3	43,500	129.0	27,300	124.2	14,600	123.7	13,500	122.3	10,600
5	134.7	49,900	133.2	43,100	128.8	26,700	124.2	14,600	123.5	13,100	122.3	10,600
6	134.8	50,400	133.1	42,600	128.7	26,400	124.1	14,300	123.8	13,700	122.1	10,300
7	134.7	49,900	133.1	42,600	128.4	25,400	124.0	14,100	123.6	13,300	122.1	10,300
8	134.8	50,400	132.8	41,400	128.4	25,400	124.0	14,100	123.6	13,300	122.1	10,300
9	134.7	49,900	132.7	40,900	128.1	24,500	124.0	14,100	123.6	13,300	122.1	10,300
10	134.8	50,400	132.5	40,100	128.1	24,500	124.0	14,100	123.6	13,300	122.1	10,300
11	134.8	50,400	132.3	39,300	127.3	22,300	123.8	13,700	123.7	13,500	122.1	10,300
12	135.0	51,400	132.1	38,500	127.3	22,300	123.8	13,700	123.6	13,300	122.1	10,300
13	134.8	50,400	131.9	37,700	127.2	22,000	123.7	13,500	123.6	13,300	122.3	10,600
14	134.7	49,900	131.8	37,300	126.8	20,900	123.6	13,300	123.6	13,300	122.1	10,300
15	134.6	49,500	131.7	37,000	126.7	20,600	123.6	13,300	123.4	12,900	121.9	9,920
16	134.5	49,000	131.5	36,200	126.5	20,100	123.5	13,100	123.4	12,900	121.9	9,920
17	134.4	48,500	131.3	35,500	126.2	19,300	123.4	12,900	123.2	12,400	121.9	9,920
18	134.5	49,000	131.2	35,100	126.0	18,800	123.3	12,600	123.2	12,400	121.9	9,920
19	134.5	49,000	131.1	34,700	125.8	18,300	123.3	12,600	123.2	12,400	121.7	9,560
20	134.5	49,000	131.0	34,300	125.7	18,100	123.3	12,600	123.2	12,400	121.7	9,560
21	134.2	47,600	131.0	34,300	125.7	18,100	123.3	12,600	123.2	12,400	121.7	9,560
22	134.2	47,600	131.0	34,300	125.3	17,100	123.3	12,600	123.2	12,400	121.6	9,390
23	134.2	47,600	131.0	34,300	125.3	17,100	123.3	12,600	123.1	12,200	121.8	9,740
24	134.1	47,100	130.8	33,600	125.2	16,900	123.3	12,600	123.0	12,000	121.8	9,740
25	134.2	47,600	130.8	33,600	125.1	16,600	123.2	12,400	123.0	12,000	121.7	9,560
26	134.0	46,600	130.7	33,200	124.8	15,900	123.2	12,400	128.9	11,800	121.6	9,390
27	134.0	46,600	130.3	31,800	124.9	16,100	123.3	12,600	128.8	11,600	121.5	9,220
28	133.8	45,700	130.1	31,100	124.7	15,700	123.4	12,900	128.8	11,600	121.5	9,220
29	133.8	45,700	130.0	30,700	124.6	15,500	123.4	12,900	128.8	11,600	121.5	9,220
30	133.5	44,400	129.8	30,000	124.6	15,500	123.4	12,900	128.6	11,200	121.4	9,050
31	133.6	44,800	129.8	30,000	....	....	..	13,300	....	....	121.3	8,880

Monthly Discharge of Kootenay River at Bonnington Falls for 1915.

(Drainage area, 17,800 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	9,740	7,520	8,690	0.49	0.57	534,000
February	7,660	7,000	7,370	0.41	0.43	409,000
March	9,220	7,130	7,630	0.43	0.50	469,000
April	34,700	9,390	20,300	1.14	1.27	1,210,000
May	49,900	35,800	45,100	2.58	2.92	2,770,000
June	49,900	45,700	47,800	2.68	2.99	2,840,000
July	51,400	44,400	48,600	2.73	3.15	2,990,000
August	44,400	30,000	37,100	2.08	2.40	2,280,000
September	29,000	15,500	21,100	1.19	1.33	1,250,000
October	15,300	12,400	13,400	0.75	0.87	824,000
November	13,700	11,200	12,700	0.71	0.79	756,000
December	11,200	8,880	9,970	0.56	0.65	613,000
The year	51,400	7,000	23,300	1.31	17.87	16,945,000

KOOTENAY RIVER.—(3014).

Location.—The station is located 10 miles above the mouth of the river, at ferry cable put in by the Doukhobour colony, near Glade.

Records Available.—1913-14-15.

Drainage Area.—Nineteen thousand one hundred square miles.

Climatic Conditions.—Similar to those at Nelson (see Kootenay river, Nelson). The river is open all the year round.

Gauge.—Staff gauges are used and read daily by Mr. F. Striloiff.

Channel.—Straight and uniform. There are riffles 1,000 yards above and below section.

Discharge Measurements.—The 1915 rating curve is based on six meterings made in 1913, six in 1914, and two in 1915.

Accuracy.—"A." The section is ideal for metering purposes. The curve is satisfactory. Results are considered within 5 per cent.

Discharge Measurements of Kootenay River at Glade (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
June 13	Richardson	1,048	720	16,000	9.63	24.5	154,000
July 3	(Prov.) Lawley	1,527	706	12,400	8.38	19.8	104,000
July 31	(Prov.) Lawley	1,527	655	8,930	6.21	14.6	55,000
Aug. 6	Richardson	1,672	660	8,450	6.08	13.8	51,400
Sept. 6	(Prov.) Lawley	1,527	600	6,980	4.81	11.5	33,600
Nov. 27	Richardson	1,527	550	4,940	3.05	7.82	15,100
1914							
Jan. 3	Webb	1,048	549	4,580	2.82	2.52	12,900
Mar. 9	Richardson	1,672	530	4,000	2.22	1.57	8,900
June 1	Elliott	1,909	690	11,400	7.79	13.4	88,600
July 20	Elliott	1,909	685	10,800	7.54	12.6	81,400
Aug. 13	Richardson	1,929	630	7,700	5.25	7.80	40,400
Dec. 11	Elliott	1,929	556	5,020	3.42	3.45	17,200
1915							
Mar. 9	Elliott & Beeston	1,929	516	3,600	2.24	1.07	8,080
April 19	Corbould & Beeston	1,929	597	6,720	4.48	5.87	30,100

Daily Gauge Height and Discharge of Kootenay River at Glade for 1915.

(Drainage area, 19,100 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.0	10,900	1.3	8,690	1.1	8,110	2.2	11,700	7.8	41,200	10.0	58,200
2	2.0	10,900	1.3	8,690	1.1	8,110	2.55	13,000	7.8	41,200	10.0	58,200
3	2.0	10,900	1.3	8,690	1.1	8,110	2.85	14,100	7.8	41,200	10.0	58,200
4	2.0	10,900	1.3	8,690	1.1	8,110	3.0	14,700	8.0	42,700	10.0	58,200
5	2.0	10,900	1.3	8,690	1.1	8,110	3.05	14,900	8.2	44,100	10.0	58,200
6	2.0	10,900	1.3	8,690	1.1	8,110	3.2	15,600	8.25	44,500	10.0	58,200
7	2.0	10,900	1.2	8,400	1.1	8,110	3.25	15,800	8.45	46,000	10.0	58,200
8	2.0	10,900	1.2	8,400	1.1	8,110	3.45	16,600	8.75	48,300	10.0	58,200
9	1.9	10,600	1.1	8,110	1.1	8,110	3.6	17,300	8.95	49,800	10.0	58,200
10	1.9	10,600	1.1	8,110	1.1	8,110	3.65	17,500	9.15	51,400	9.9	57,400
11	1.9	10,600	1.1	8,110	1.1	8,110	3.75	18,000	9.25	52,200	9.9	57,400
12	1.8	10,300	1.1	8,110	1.1	8,110	3.95	18,800	9.3	52,600	9.9	57,400
13	1.8	10,300	1.1	8,110	1.1	8,110	4.1	19,500	9.4	53,400	9.6	55,000
14	1.8	10,300	1.1	8,110	1.1	8,110	4.25	20,200	9.55	54,600	9.5	54,200
15	1.8	10,300	1.1	8,110	1.1	8,110	4.45	21,200	9.65	55,400	9.5	54,200
16	1.7	9,940	1.1	8,110	1.2	8,400	4.65	22,200	9.7	55,800	9.4	53,400
17	1.7	9,940	1.1	8,110	1.2	8,400	5.0	24,000	9.7	55,800	9.4	53,400
18	1.7	9,940	1.1	8,110	1.2	8,400	5.5	26,700	9.7	55,800	9.4	53,400
19	1.6	9,610	1.1	8,110	1.25	8,540	5.85	28,600	9.8	56,600	9.35	53,000
20	1.6	9,610	1.1	8,110	1.3	8,690	6.25	31,000	9.7	55,800	9.25	52,200
21	1.6	9,610	1.1	8,110	1.5	9,290	6.35	31,600	9.7	55,800	9.2	51,800
22	1.6	9,610	1.1	8,110	1.5	9,290	6.65	33,500	9.7	55,800	9.2	51,800
23	1.6	9,610	1.1	8,110	1.5	9,290	6.8	34,500	9.8	56,600	9.2	51,800
24	1.5	9,290	1.1	8,110	1.65	9,780	7.0	35,800	9.7	55,800	9.2	51,800
25	1.4	8,990	1.1	8,110	1.8	10,300	7.1	36,400	9.7	55,800	9.2	51,800
26	1.3	8,690	1.1	8,110	1.9	10,600	7.1	36,400	9.7	55,800	9.2	51,800
27	1.3	8,690	1.1	8,110	1.9	10,600	7.2	37,100	9.75	56,200	9.3	52,600
28	1.3	8,690	1.1	8,110	2.0	10,900	7.3	37,800	9.8	56,600	9.4	53,400
29	1.3	8,690	....	....	2.0	10,900	7.3	37,800	9.8	56,600	9.45	53,800
30	1.2	8,400	....	....	2.0	10,900	7.7	40,500	10.1	59,000	9.55	54,600
31	1.3	8,690	....	....	2.1	11,300	....	....	10.1	59,000	....	....

	July.		August.		September.		October.		November.		December.	
1	9.65	55,400	8.80	48,700	6.45	32,200	3.60	17,300	3.00	14,700	2.50	12,800
2	9.80	56,600	8.75	48,300	6.35	31,600	3.55	17,100	3.00	14,700	2.50	12,800
3	9.80	56,600	8.75	48,300	6.20	30,700	3.50	16,900	3.10	15,100	2.40	12,400
4	9.80	56,600	8.60	47,100	6.10	30,100	3.40	16,400	3.10	15,100	2.40	12,400
5	9.80	56,600	8.50	46,400	5.95	29,200	3.30	16,000	3.10	15,100	2.40	12,400
6	9.80	56,600	8.45	46,000	5.85	28,600	3.30	16,000	3.15	15,400	2.30	12,000
7	9.95	57,800	8.35	45,200	5.75	28,100	3.30	16,000	3.20	15,600	2.35	12,200
8	9.90	57,400	8.30	44,900	5.65	27,500	3.30	16,000	3.20	15,600	2.20	11,700
9	9.90	57,400	8.20	44,100	5.45	27,000	3.20	15,600	3.20	15,600	2.20	11,700
10	9.90	57,400	8.10	43,400	5.35	25,800	3.10	15,100	3.20	15,600	2.20	11,700
11	9.90	57,400	8.00	42,700	5.20	25,300	3.00	14,700	3.10	15,100	2.30	12,000
12	9.85	57,000	7.85	41,600	5.15	24,800	3.00	14,700	3.10	15,100	2.30	12,000
13	9.80	56,600	7.80	41,200	5.05	24,200	3.00	14,700	3.00	14,700	2.30	12,000
14	9.70	55,800	7.70	40,500	4.95	23,800	2.90	14,300	3.00	14,700	2.20	11,700
15	9.65	55,400	7.60	39,800	4.85	23,200	2.90	14,300	3.00	14,700	2.15	11,500
16	9.60	55,000	7.50	39,100	4.70	22,500	2.90	14,300	2.90	14,300	2.20	11,700
17	9.50	54,200	7.40	38,400	4.65	22,200	2.90	14,300	2.90	14,300	2.20	11,700
18	9.50	54,200	7.30	37,800	4.55	21,800	2.90	14,300	2.80	13,900	2.20	11,700
19	9.25	52,200	7.20	37,100	4.40	21,000	2.80	13,900	2.80	13,900	2.10	11,300
20	9.20	51,800	7.20	37,100	4.30	20,500	2.85	14,100	2.80	13,900	2.10	11,300
21	9.30	52,600	7.20	37,100	4.15	19,800	2.90	14,300	2.80	13,900	2.00	10,900
22	9.30	52,600	7.10	36,400	4.20	20,000	2.90	14,300	2.80	13,900	2.00	10,900
23	9.30	52,600	7.10	36,400	4.10	19,500	3.00	14,700	2.80	13,900	2.00	10,900
24	9.20	51,800	7.00	35,800	4.05	19,300	2.80	13,900	2.70	13,500	2.00	10,900
25	9.05	50,600	6.85	34,800	4.00	19,100	2.80	13,900	2.70	13,500	2.00	10,900
26	9.00	50,200	6.75	34,200	3.95	18,800	2.90	14,300	2.60	13,100	2.00	10,900
27	9.15	51,400	6.65	33,500	3.90	18,600	2.90	14,300	2.60	13,100	2.00	10,900
28	9.05	50,600	6.60	33,200	3.80	18,200	2.90	14,300	2.60	13,100	2.00	10,900
29	8.95	49,800	6.60	33,200	3.75	18,000	2.90	14,300	2.60	13,100	1.95	10,800
30	8.85	49,000	6.55	32,900	3.70	17,700	3.00	14,700	2.50	12,800	1.95	10,800
31	8.80	48,700	6.50	32,600	....	....	2.85	14,100	....	....	1.70	9,940

Monthly Discharge of Kootenay River at Glade for 1915.

(Drainage area, 19,100 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	10,900	8,400	9,940	0.52	0.60	611,000
February	8,690	8,110	8,260	0.43	0.45	459,000
March	11,300	8,110	8,940	0.47	0.54	550,000
April	40,500	11,700	24,800	1.29	1.44	1,480,000
May	59,000	41,200	52,300	2.74	3.16	3,220,000
June	58,200	51,800	55,000	2.88	3.21	3,270,000
July	57,800	48,700	54,100	2.83	3.26	3,330,000
August	48,700	32,600	39,900	2.09	2.41	2,450,000
September	32,200	17,700	23,600	1.24	1.38	1,400,000
October	17,300	13,900	15,000	0.79	0.91	922,000
November	15,600	12,800	14,400	0.75	0.84	857,000
December	12,800	9,940	11,500	0.60	0.69	707,000
The year	59,000	8,110	26,500	1.39	18.89	19,256,000

KOOTENAY RIVER.—(3077).

Location.—The gauge is located at Astley's wharf, Nelson, 25 miles above the mouth of river.

Records Available.—1913-14-15.

Drainage Area.—Seventeen thousand seven hundred square miles.

Climatic Conditions.—Winters are mild, with light snowfall. Occasionally the west arm of the lake freezes over. The summers are temperate, with occasional hot days, but the evenings are always cool. Precipitation is heaviest during the spring and fall. July, August and September are considered the dry months.

Gauge.—A vertical staff, 20 feet long, and read daily by Mr. W. F. Mawdsley.

Method of Compilation.—The discharge curve is obtained by subtracting the discharge of Slocan river from the discharge of the Kootenay, near Glade, allowing for the inflow between Nelson and Glade, which is less than 1 per cent.

Accuracy.—"B." Cannot be guaranteed, owing to the difficulties with the Slocan river rating curve, to be closer than 10 per cent.

Daily Gauge Height and Discharge of Kootenay River at Nelson for 1915.

(Drainage area, 17,700 square miles)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.5	10,100	0.8	7,810	0.65	7,380	1.45	9,940	6.45	35,300	8.7	49,500
2	1.45	9,940	0.8	7,810	0.65	7,380	1.55	10,300	6.55	35,900	8.7	49,500
3	1.45	9,940	0.75	7,660	0.65	7,380	1.7	10,900	6.65	36,600	8.7	49,500
4	1.45	9,940	0.75	7,660	0.6	7,230	1.85	11,400	6.8	37,500	8.7	49,500
5	1.45	9,940	0.8	7,810	0.6	7,230	2.0	12,000	6.9	38,200	8.7	49,500
6	1.45	9,940	0.8	7,810	0.65	7,380	2.1	12,400	7.05	39,100	8.7	49,500
7	1.4	9,770	0.75	7,660	0.65	7,330	2.2	12,800	7.15	39,800	8.7	49,500
8	1.4	9,770	0.75	7,660	0.6	7,230	2.3	13,300	7.3	40,700	8.7	49,500
9	1.35	9,600	0.75	7,660	0.6	7,230	2.45	13,900	7.45	41,700	8.7	49,500
10	1.35	9,600	0.75	7,660	0.6	7,230	2.6	14,500	7.65	42,900	8.65	49,200
11	1.3	9,420	0.7	7,520	0.6	7,230	2.7	15,000	7.85	44,200	8.65	49,200
12	1.2	9,080	0.7	7,520	0.6	7,230	2.85	15,600	8.0	45,100	8.6	48,900
13	1.35	9,600	0.7	7,520	0.65	7,380	2.95	16,100	8.2	46,400	8.5	48,300
14	1.35	9,600	0.7	7,520	0.65	7,380	3.1	16,800	8.35	47,400	8.4	47,700
15	1.3	9,420	0.7	7,520	0.65	7,380	3.35	18,000	8.5	48,300	8.3	47,000
16	1.25	9,250	0.65	7,380	0.7	7,520	3.6	19,200	8.55	48,600	8.25	46,700
17	1.25	9,250	0.65	7,380	0.75	7,660	3.85	20,400	8.55	48,600	8.25	46,700
18	1.2	9,080	0.65	7,380	0.75	7,660	4.05	21,400	8.55	48,600	8.25	46,700
19	1.2	9,080	0.7	7,520	0.75	7,660	4.35	23,000	8.55	48,600	8.2	46,400
20	1.15	8,920	0.7	7,520	0.8	7,810	4.8	25,500	8.5	48,300	8.15	46,000
21	1.15	8,920	0.7	7,520	0.8	7,810	5.15	27,500	8.5	48,300	8.15	46,000
22	1.1	8,750	0.65	7,380	0.85	7,960	5.4	28,900	8.5	48,300	8.1	45,700
23	1.1	8,750	0.65	7,380	0.9	8,110	5.6	30,100	8.5	48,300	8.1	45,700
24	1.05	8,580	0.65	7,380	1.0	8,420	5.8	31,300	8.45	48,000	8.05	45,400
25	1.0	8,420	0.65	7,380	1.1	8,750	5.9	31,900	8.45	48,000	8.1	45,700
26	0.95	8,260	0.65	7,380	1.2	9,080	5.95	32,200	8.5	48,300	8.2	46,400
27	0.95	8,260	0.65	7,380	1.25	9,250	6.05	32,800	8.55	48,600	8.3	47,000
28	0.9	8,110	0.65	7,380	1.3	9,420	6.1	33,100	8.6	48,900	8.35	47,400
29	0.9	8,110	....	....	1.3	9,420	6.15	33,400	8.65	49,200	8.5	48,300
30	0.85	7,960	....	....	1.35	9,600	6.3	34,400	8.7	49,500	8.65	49,200
31	0.8	7,810	....	....	1.4	9,770	....	....	8.65	49,200	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	8.75	49,800	7.75	43,600	5.4	28,900	2.85	15,600	2.15	12,600	1.8	11,200
2	8.75	49,800	7.7	43,200	5.35	28,600	2.8	15,400	2.25	13,000	1.7	10,900
3	8.9	50,800	7.7	43,200	5.25	28,000	2.75	15,200	2.35	13,500	1.6	10,500
4	8.95	51,100	7.65	42,900	5.2	27,800	2.7	15,000	2.35	13,500	1.55	10,300
5	9.0	51,400	7.55	42,300	5.1	27,200	2.65	14,800	2.35	13,500	1.5	10,100
6	9.0	51,400	7.45	41,700	5.0	26,600	2.65	14,800	2.35	13,500	1.55	10,300
7	9.05	51,700	7.0	38,800	4.9	26,000	2.65	14,800	2.4	13,700	1.45	9,940
8	9.05	51,700	7.3	40,700	4.7	24,900	2.6	14,500	2.4	13,700	1.45	9,940
9	9.0	51,400	7.2	40,100	4.6	24,400	2.55	14,300	2.4	13,700	1.45	9,940
10	9.0	51,400	7.1	39,400	4.5	23,800	2.5	14,100	2.4	13,700	1.5	10,100
11	8.9	50,800	7.0	38,800	4.4	23,300	2.5	14,100	2.4	13,700	1.55	10,300
12	8.8	50,200	6.9	38,200	4.3	22,800	2.5	14,100	2.4	13,700	1.6	10,500
13	8.65	49,200	6.85	37,800	4.2	22,200	2.4	13,700	2.4	13,700	1.6	10,500
14	8.65	49,200	6.75	37,200	4.1	21,700	2.3	13,300	2.3	13,300	1.55	10,300
15	8.55	48,600	6.7	36,900	4.0	21,200	2.3	13,300	2.25	13,000	1.5	10,100
16	8.45	48,000	6.6	36,200	3.9	20,700	2.3	13,300	2.2	12,800	1.45	9,940
17	8.45	48,000	6.5	35,600	3.75	20,000	2.3	13,300	2.2	12,800	1.45	9,940
18	8.4	47,700	6.4	35,000	3.6	19,200	2.25	13,000	2.2	12,800	1.4	9,770
19	8.35	47,400	6.35	34,700	3.5	18,700	2.2	12,800	2.1	12,400	1.4	9,770
20	8.35	47,400	6.3	34,400	3.45	18,400	2.2	12,800	2.05	12,200	1.4	9,770
21	8.3	47,000	6.25	34,000	3.35	18,000	2.15	12,600	2.1	12,400	1.4	9,770
22	8.3	47,000	6.2	33,700	3.25	17,500	2.1	12,400	2.1	12,400	....	9,680
23	8.2	46,400	6.1	33,100	3.2	17,300	2.1	12,400	2.1	12,400	1.35	9,600
24	8.2	46,400	6.0	32,500	3.15	17,000	2.1	12,400	2.1	12,400	1.3	9,420
25	8.15	46,000	5.95	32,200	3.1	16,800	2.05	12,200	2.1	12,400	1.3	9,420
26	8.1	45,700	5.9	31,900	3.05	16,600	2.05	12,200	2.0	12,000	1.25	9,250
27	8.0	45,100	5.8	31,300	3.0	16,300	2.0	12,000	2.0	12,000	1.25	9,250
28	8.0	45,100	5.7	30,700	2.95	16,100	2.05	12,200	2.0	12,000	1.24	9,220
29	7.9	44,500	5.65	30,400	2.9	15,900	2.0	12,000	1.95	11,800	1.23	9,180
30	7.85	44,200	5.6	30,100	2.9	15,900	2.05	12,200	1.9	11,600	1.21	9,110
31	7.8	43,900	5.55	29,800	....	....	2.1	12,400	....	....	1.19	9,050

Monthly Discharge of Kootenay River at Nelson for 1915.

(Drainage area, 17,700 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	10,100	7,810	9,130	0.52	0.60	561,000
February	7,810	7,380	7,540	0.43	0.45	419,000
March	9,770	7,230	7,920	0.45	0.52	487,000
April	34,400	9,940	20,900	1.18	1.32	1,240,000
May	49,500	35,300	45,000	2.55	2.94	2,770,000
June	49,500	45,400	47,800	2.76	3.08	2,840,000
July	51,700	43,900	48,300	2.73	3.15	2,970,000
August	43,600	29,800	36,500	2.06	2.38	2,240,000
September	28,900	15,900	21,400	1.21	1.35	1,270,000
October	15,600	12,000	13,500	0.76	0.88	830,000
November	13,700	11,600	12,900	0.73	0.81	768,000
December	11,200	9,050	9,910	0.56	0.65	609,000
The year	51,700	7,230	23,400	1.32	18.13	17,004,000

PEND d'OREILLE RIVER.—(3017).

Location.—The gauging section is located 9 miles above the mouth, near Mr. A. G. Lang's ranch, in the vicinity of Waneta.

Records Available.—May, 1913, to September, 1915.

Drainage Area.—Twenty-six thousand six hundred square miles.

Climatic Conditions.—Precipitation is light over practically all of the Pend d'Oreille drainage area. The summers are hot and fairly dry, the winters mild, temperature seldom going below zero. The river, in Canada, seldom freezes over, and frazil ice will not be a serious factor.

Gauge.—Vertical staff gauges were used and read two or three times weekly, except during high water (when daily readings were taken), by Mr. A. G. Lang.

Channel.—The Pend d'Oreille, through Canada, is very swift, and there are few, if any, favorable metering sections. The section chosen is very fast in high water, but satisfactory at low water, and appears to have a permanent control.

Discharge Measurements.—The 1915 rating curve is based on six measurements in 1913, three in 1914, and six in 1915.

Accuracy.—"A," "B" and "C." Readings, as a rule, were only taken two or three times weekly, and high water measurements were not altogether satisfactory, therefore, the results cannot be guaranteed closer than 15 per cent, though at the lower stages of the water it is thought to be within 5 and 10 per cent.

Discharge Measurements of Pend d'Oreille River at Waneta (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
June 11	Richardson	1,048	440	12,400	10.40	26.80	128,000[1]
June 25	(Prov.) Lawley			9,940	10.70	24.20	106,000
July 15	(Prov.) Lawley			7,090	8.40	17.10	59,600
Aug. 4	(Prov.) Lawley			4,780	6.03	10.24	28,800
Sept. 2	(Prov.) Lawley			3,380	4.19	5.41	14,200
Nov. 6	Richardson & Webb	1,048	260	3,350	3.32	3.20	11,200
1914							
June 3	Elliott & Beeston	1,909	380	9,260	8.52	18.95	78,900
July 18	Elliott & Gill	1,909	310	6,350	6.08	10.60	38,600
Nov. 12	Elliott & Beeston	1,909	285	4,860	4.63	5.60	22,500
1915							
Jan. 5	Elliott & Beeston	1,927	260	4,240	3.30	3.60	14,000
Feb. 12	Corbould	1,909	260	3,770	2.76	1.95	10,400
Mar. 20	Elliott	1,909	255	3,710	3.18	2.70	11,700
June 5	Dempster & Beeston	1,909	312	6,530	6.67	12.00	43,500
Aug. 10	Dempster & Beeston	1,927	294	5,000	4.84	7.54	24,200
Sept. 3	Richardson	1,927	284	4,730	3.38	4.24	16,000

[1] Old measurement recomputed under new soundings, February, 1915.

Daily Gauge Height and Discharge of Pend d'Oreille River at Waneta for 1915.

(Drainage area, 26,600 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	13,200	1.8	9,100	....	9,800	....	15,600	9.3	31,800	12.3	43,400
2	3.5	13,400	....	9,200	2.1	9,850	....	16,400	....	32,200	....	43,100
3	....	13,500	....	9,250	....	9,800	4.8	17,200	....	32,700	....	42,800
4	....	13,600	....	9,300	....	9,700	....	17,200	9.7	33,200	....	42,500
5	3.6	13,700	1.9	9,350	2.0	9,600	....	17,200	....	33,500	12.0	42,200
6	....	13,300	....	9,350	....	9,600	4.8	17,200	....	33,800	....	41,900
7	....	12,900	1.9	9,350	....	9,600	....	17,200	....	34,100	....	41,600
8	....	12,600	....	9,350	....	9,600	....	17,400	10.0	34,400	11.8	41,400
9	3.1	12,300	....	9,350	2.0	9,600	....	17,600	....	34,600	....	41,400
10	....	12,100	....	9,350	....	9,500	5.0	17,800	....	34,800	....	41,400
11	....	11,900	1.9	9,350	....	9,400	....	18,600	....	35,000	....	41,400
12	....	11,700	1.95	9,480	1.9	9,350	....	19,400	10.2	35,200	11.8	41,400
13	2.8	11,500	....	9,400	....	9,700	5.8	20,200	....	35,700	....	41,500
14	....	11,400	....	9,300	....	10,000	....	20,900	....	36,200	....	41,600
15	....	11,300	....	9,200	....	10,300	....	21,500	10.6	36,800	11.9	41,800
16	2.7	11,200	1.8	9,100	2.4	10,600	....	22,100	....	37,100	....	41,700
17	....	11,100	....	9,100	....	10,800	6.6	22,700	....	37,400	....	41,600
18	....	10,900	....	9,100	....	10,800	....	23,600	10.8	37,600	....	41,500
19	2.5	10,800	....	9,100	2.6	11,000	....	24,600	....	38,000	11.8	41,400
20	....	10,700	1.8	9,100	....	11,400	7.5	25,600	....	38,400	....	41,400
21	....	10,600	....	9,150	....	11,800	....	25,900	....	38,900	....	41,400
22	2.3	10,400	....	9,200	....	12,200	....	26,200	11.3	39,400	11.8	41,400
23	....	10,200	....	9,250	3.2	12,600	....	26,500	....	40,300	....	41,100
24	....	10,000	1.9	9,350	....	12,800	7.9	26,900	....	41,200	....	40,800
25	....	9,800	....	9,400	....	13,100	....	27,300	12.0	42,200	11.6	40,600
26	2.0	9,600	....	9,500	....	13,400	....	27,800	....	42,600	....	40,400
27	....	9,300	2.0	9,600	3.5	13,700	8.3	28,300	....	43,000	....	40,100
28	....	9,000	....	9,700	....	13,800	....	29,100	....	43,400	11.4	39,800
29	1.6	8,600	....	....	....	13,900	....	30,000	12.4	43,800	....	39,700
30	....	8,800	....	....	3.7	14,000	....	30,900	....	43,600	....	39,600
31	....	9,000	....	....	....	14,800	....	....	....	43,600	....	....

	July.		August.		September.		October.		November.		December.	
1	....	39,400	....	29,700	....	17,800	....	....	....	....	....	....
2	11.25	39,200	....	29,400	4.9	17,500	....	....	....	....	....	....
3	....	38,800	8.55	29,200	4.9	17,500	....	....	....	....	....	....
4	....	38,500	....	28,600	....	17,200	....	....	....	....	....	....
5	....	38,100	....	28,100	4.7	16,900	....	....	....	....	....	....
6	10.85	37,800	....	27,600	....	16,600	....	....	....	....	....	....
7	....	37,500	7.95	27,000	....	16,400	....	....	....	....	....	....
8	....	37,200	....	26,700	....	16,200	....	....	....	....	....	....
9	10.65	37,000	....	26,300	4.4	16,000	....	....	....	....	....	....
10	....	36,600	7.6	25,900	....	15,900	....	....	....	....	....	....
11	....	36,200	....	25,300	....	15,700	....	....	....	....	....	....
12	....	35,800	....	24,800	....	15,600	....	....	....	....	....	....
13	10.25	35,400	7.1	24,300	4.2	15,400	....	....	....	....	....	....
14	....	35,500	....	24,200	....	15,300	....	....	....	....	....	....
15	....	35,700	....	24,100	....	15,200	....	....	....	....	....	....
16	10.35	35,800	7.0	24,000	....	15,000	....	....	....	....	....	....
17	....	35,400	....	23,400	....	14,900	....	....	....	....	....	....
18	....	35,000	....	22,800	4.0	14,800	....	....	....	....	....	....
19	....	34,600	....	22,200	4.0	14,800	....	....	....	....	....	....
20	9.95	34,200	6.3	21,700	....	14,700	....	....	....	....	....	....
21	....	33,800	....	21,400	....	14,600	....	....	....	....	....	....
22	....	33,400	....	21,100	3.9	14,500	....	....	....	....	....	....
23	9.65	33,000	....	20,800	....	14,300	....	....	....	....	....	....
24	....	32,600	5.9	20,500	3.8	14,200	....	....	....	....	....	....
25	....	32,300	....	20,100	....	14,200	....	....	....	....	....	....
26	9.35	32,000	....	19,700	....	14,100	....	....	....	....	....	....
27	....	31,500	5.5	19,300	....	14,100	....	....	....	....	....	....
28	....	31,000	....	18,900	....	14,000	....	....	....	....	....	....
29	....	30,600	5.25	18,600	3.7	14,000	....	....	....	....	....	....
30	8.85	30,200	....	18,300	....	14,000	....	....	....	....	....	....
31	....	30,000	....	18,100	....	....	....	....	....	....	....	....

Monthly Discharge of Pend d'Oreille River at Waneta for 1915.

(Drainage area, 26,600 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	13,700	8,600	11,200	0.42	0.48	689,000
February	9,700	9,100	9,300	0.35	0.36	516,000
March	14,800	9,350	11,200	0.42	0.48	689,000
April	30,900	15,600	22,300	0.84	0.94	1,330,000
May	43,800	31,800	37,600	1.41	1.63	2,310,000
June	43,400	39,600	40,100	1.51	1.68	2,390,000
July	39,400	30,000	35,000	1.32	1.52	2,150,000
August	29,700	18,100	23,600	0.89	1.03	1,450,000
September	17,800	14,000	15,400	0.58	0.65	916,000
The period	43,800	8,600	22,800	0.86	8.77	12,440,000

SILVERTON CREEK.—(3027).

Location.—At bridge, about 3 miles from the mouth, and about ¼ mile below the Hewitt mill.

Records Available.—1914 and 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Summers hot, with light rainfall after June. Winters mild, moderate snowfall. The creek does not stay frozen more than a few days at a time. Frazil ice may be expected occasionally.

Channel.—Swift water, with rocky bed.

Discharge Measurements.—The 1915 data is based on six measurements in 1914, and five in 1915.

Accuracy.—"D." The section is not suitable for good measurements, and accuracy cannot be guaranteed, but should be within 20 per cent.

Discharge Measurements of Silverton Creek at Silverton (Below Mill) (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 19	Webb & Gill	1,048	26.5	43.0	3.97	0.85	171
May 12	Elliott & Beeston	1,672	33.5	63.5	4.69	1.20	298
June 11	Richardson & Beeston	1,927	30.0	57.2	4.81	1.15	275
July 9	Gill	1,929	28.0	66.0	4.30	1.25	283
Aug. 18	Gill	1,929	24.0	33.1	2.64	0.50	87.6
Nov. 3	Elliott	1,909	22.0	32.5	3.12	0.50	101
1915							
Mar. 18	Beeston	1,929	18.0	18.6	2.10	0.35	39.0
April 28	Corbould	1,927	26.0	46.0	3.02	1.30	139
June 10	Richardson	1,927	28.0	56.1	4.18	1.50	235
Sept. 9	Dempster	1,927	20.0	24.6	2.16	0.80	54.0
Dec. 1	Beeston	1,927	19.0	16.9	2.61	0.53	44.1

Daily Gauge Height and Discharge of Silverton Creek at Silverton (Below Mill) for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.0	....	0.4	38.0	0.35	37.0	0.55	42.8	1.48	208	2.0	431
2	0.0	....	0.4	38.0	0.35	37.0	0.88	68.7	1.48	208	1.9	384
3	0.0	....	0.4	38.0	0.35	37.0	1.08	99.5	1.48	208	1.8	339
4	0.0	....	0.4	38.0	0.35	37.0	0.95	78.2	1.4	180	1.7	296
5	0.0	....	0.4	38.0	0.35	37.0	0.90	71.0	1.4	180	1.68	288
6	0.0	....	0.4	38.0	0.35	37.0	0.88	68.7	1.4	180	1.68	288
7	0.0	....	0.4	38.0	0.35	37.0	0.90	71.0	1.52	223	1.85	362
8	0.0	....	0.4	38.0	0.35	37.0	0.90	71.0	1.58	246	1.75	318
9	0.0	....	0.4	38.0	0.35	37.0	0.90	71.0	1.62	262	1.58	246
10	0.0	....	0.4	38.0	0.35	37.0	0.90	71.0	1.72	305	1.52	223
11	0.45	39.5	0.4	38.0	0.35	37.0	0.90	71.0	1.62	262	1.5	215
12	0.45	39.5	0.4	38.0	0.35	37.0	0.90	71.0	1.6	254	1.55	234
13	0.45	39.5	0.4	38.0	0.35	37.0	0.98	82.6	1.6	254	1.68	288
14	0.45	39.5	0.36	37.2	0.35	37.0	1.05	94.2	1.58	246	1.72	305
15	0.45	39.5	0.3	36.0	0.35	37.0	1.1	103.0	1.68	288	1.65	275
16	0.45	39.5	0.25	35.0	0.40	38.0	1.16	116.0	1.45	198	1.62	262
17	0.45	39.5	0.25	35.0	0.45	39.5	1.3	150.0	1.52	223	1.65	275
18	0.45	39.5	0.31	36.2	0.45	39.5	1.45	198.0	1.48	208	1.68	288
19	0.45	39.5	0.39	37.8	0.45	39.5	1.55	234.0	1.52	223	1.62	262
20	0.45	39.5	0.4	38.0	0.5	41.0	1.6	254.0	1.6	254	1.5	215
21	0.45	39.5	0.35	37.0	0.5	41.0	1.42	187.0	1.65	275	1.5	215
22	0.45	39.5	0.35	37.0	0.51	41.4	1.38	174.0	1.6	254	1.5	215
23	0.4	38.0	0.35	37.0	0.56	43.1	1.32	156.0	1.58	246	1.45	198
24	0.4	38.0	0.35	37.0	0.59	44.2	1.35	165.0	1.68	288	1.5	215
25	0.4	38.0	0.35	37.0	0.53	42.0	1.3	150.0	1.7	296	1.55	234
26	0.4	38.0	0.35	37.0	0.52	41.7	1.3	150.0	1.65	275	1.72	305
27	0.4	38.0	0.35	37.0	0.56	43.1	1.3	150.0	1.72	305	1.58	246
28	0.4	38.0	0.35	37.0	0.44	39.2	1.3	150.0	2.05	455	1.48	208
29	0.4	38.0	....	....	0.47	40.1	1.52	223.0	1.95	408	1.5	215
30	0.4	38.0	....	....	0.51	41.4	1.5	215.0	2.1	480	1.6	254
31	0.4	38.0	....	....	0.5	41.0	....	....	2.1	480	....	....

	July.		August.		September.		October.		November.		December.	
1	1.60	254	1.40	180	0.90	71.0	0.70	51.0	....	71.0	0.60	44.5
2	1.60	254	1.35	165	0.90	71.0	0.70	51.0	....	71.0	0.60	44.5
3	1.60	254	1.30	150	0.90	71.0	0.88	68.7	....	59.5	0.60	14.5
4	1.60	254	1.20	124	0.90	71.0	0.90	71.0	....	59.5	0.60	44.5
5	1.60	254	1.20	124	0.85	65.2	0.85	65.2	....	59.5	0.55	42.8
6	1.58	246	1.15	114	0.85	65.2	0.85	65.2	....	59.5	0.60	44.5
7	1.58	246	1.15	114	0.85	65.2	0.80	59.5	....	59.5	0.55	42.8
8	1.50	215	1.15	114	0.90	71.0	0.80	59.5	....	59.5	0.50	41.0
9	1.50	215	1.10	103	0.90	71.0	0.80	59.5	....	59.5	0.50	41.0
10	1.45	198	1.10	103	0.85	65.2	0.80	59.5	....	51.0	0.50	41.0
11	1.40	180	1.10	103	0.85	65.2	0.80	59.5	....	51.0	0.50	41.0
12	1.40	180	1.05	942	0.85	65.2	0.80	59.5	....	51.0	0.45	39.5
13	1.40	180	1.00	855	0.85	65.2	0.80	59.5	....	51.0	0.45	39.5
14	1.48	208	1.00	855	0.90	71.0	0.80	59.5	....	51.0	0.40	38.0
15	1.52	223	1.00	855	0.90	71.0	0.80	59.5	....	51.0	0.50	41.0
16	1.55	234	1.00	855	0.85	65.2	0.80	59.5	....	51.0	0.50	41.0
17	1.50	215	1.00	855	0.85	65.2	0.80	59.5	0.70	51.0	0.50	41.0
18	1.50	215	1.00	855	0.85	65.2	0.80	59.5	0.70	51.0	0.50	41.0
19	1.40	180	1.00	855	0.80	59.5	0.80	59.5	0.70	51.0	0.45	39.5
20	1.40	180	1.12	107	0.80	59.5	0.80	59.5	0.70	51.0	0.45	39.5
21	1.40	180	1.20	124	0.80	59.5	0.80	59.5	0.70	51.0	0.45	39.5
22	1.42	187	1.15	114	0.80	59.5	0.85	65.2	0.70	51.0	0.45	39.5
23	1.50	215	1.08	995	0.80	59.5	0.90	71.0	0.65	47.8	0.50	41.0
24	1.45	198	1.02	890	0.80	59.5	0.90	71.0	0.65	47.8	0.50	41.0
25	1.40	180	1.00	855	0.80	59.5	0.90	71.0	0.65	47.8	0.50	41.0
26	1.40	180	1.00	855	0.80	59.5	0.90	71.0	0.65	47.8	0.45	39.5
27	1.45	198	0.95	782	0.75	55.2	0.90	71.0	0.65	47.8	0.45	39.5
28	1.40	180	0.90	710	0.75	55.2	....	71.0	0.65	47.8	0.40	38.0
29	1.40	180	0.85	652	0.70	51.0	....	71.0	0.65	47.8	0.40	38.0
30	1.40	180	0.85	652	0.70	51.0	....	71.0	0.60	44.5	0.40	38.0
31	1.40	180	0.90	710	....	....	....	71.0	0.60	44.5	0.40	38.0

Monthly Discharge of Silverton Creek at Silverton (Below Mill) for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
February	38.0	35.0	37.3	....	....	2,070
March	44.2	37.0	39.1	....	....	2,400
April	254.0	42.8	127.0	....	....	7,560
May	480.0	180.0	270.0	....	....	16,600
June	431.0	208.0	270.0	....	....	16,100
July	254.0	180.0	208.0	....	....	12,800
August	180.0	65.2	101.0	....	....	6,210
September	71.0	51.0	63.6	....	....	3,780
October	71.0	51.0	63.5	....	....	3,900
November	71.0	44.5	54.8	....	....	3,260
December	44.5	38.0	40.8	....	....	2,510
The period	480.0	35.0	115.9	....	....	77,190

SILVERTON CREEK.—(3028).

Location.—Immediately above intake of flume of Hewitt mill, about 5 miles from Silverton.

Records Available.—1914 and 1915.

Drainage Area.—Thirty square miles.

Climatic Conditions.—Summers hot, light rainfall, after June. Winters not very severe, moderate snowfall. The creek does not remain frozen for more than a few days at a time. Frazil ice and anchor ice to be expected at times.

Gauge.—A vertical staff read daily by Mr. P. Harding.

Channel.—Water smooth and swift, controlled by Hewitt diversion dam.

Discharge Measurements.—The 1915 rating curve is based on five measurements in 1914 and five in 1915.

Accuracy.—"C." Results should be within 15 per cent.

Discharge Measurements of Silverton Creek at Silverton (Above Intake) (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
April 19	Webb & Gill	1,048	38.5	62.7	1.27	1.05	80.1
June 11	Richardson & Beeston	1,927	28.2	55.0	3.55	1.52	195.0
July 9	Elliott & Gill	1,929	30.5	57.8	3.56	1.58	206.0
Aug. 18	Gill	1,929	26.0	26.9	1.86	0.80	50.1
Nov. 3	Elliott & Beeston	1,909	25.0	22.6	2.09	0.80	47.4
1915							
Mar. 18	Beeston	1,929	18.0	16.3	0.93	0.75	15.1
April 28	Corbould	1,927	28.0	41.0	1.96	1.05	80.4
June 9	Richardson	1,927	28.9	49.5	2.70	1.38	133.0
Sept. 9	Dempster	1,927	30.5	26.4	1.32	0.64	34.8
Dec. 1	Beeston	1,927	30.0	46.4	0.67	Ice	31.4[1]

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[1] Ice conditions.

Daily Gauge Height and Discharge of Silverton Creek at Silverton (Above Intake) for 1915.

(Drainage area, 30 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.2	15.5	0.1	15.0	0.1	15.0	0.21	15.6	1.22	113	1.38	147
2	0.2	15.5	0.1	15.0	0.1	15.0	0.44	22.5	1.22	113	1.36	142
3	0.2	15.5	0.1	15.0	0.1	15.0	0.68	37.8	1.2	109	1.36	142
4	0.2	15.5	0.1	15.0	0.07	14.9	0.63	33.7	1.2	109	1.35	140
5	0.2	15.5	0.1	15.0	0.07	14.9	0.56	28.9	1.18	105	1.41	154
6	0.2	15.5	0.12	15.1	0.07	14.9	0.56	28.9	1.25	119	1.41	154
7	0.2	15.5	0.12	15.1	0.07	14.9	0.58	30.1	1.32	133	1.51	180
8	0.2	15.5	0.12	15.1	0.05	14.8	0.53	27.1	1.38	147	1.42	157
9	0.2	15.5	0.12	15.1	0.05	14.8	0.53	27.1	1.46	167	1.36	142
10	0.2	15.5	0.12	15.1	0.05	14.8	0.53	27.1	1.51	180	1.31	131
11	0.2	15.5	0.12	15.1	0.07	14.9	0.58	30.1	1.42	157	1.28	125
12	0.2	15.5	0.12	15.1	0.07	14.9	0.72	41.4	1.33	133	1.26	121
13	0.2	15.5	0.12	15.1	0.07	14.9	0.82	51.6	1.32	133	1.28	125
14	0.2	15.5	0.1	15.0	0.07	14.9	0.79	48.4	1.38	147	1.31	131
15	0.2	15.5	0.1	15.0	0.12	15.1	0.82	51.6	1.36	142	1.41	154
16	0.15	15.2	0.1	15.0	0.11	15.0	0.95	67.5	1.35	140	1.42	157
17	0.15	15.2	0.1	15.0	0.1	15.0	1.15	99.5	1.31	131	1.4	152
18	0.15	15.2	0.1	15.0	0.07	14.9	1.24	117.0	1.33	135	1.41	154
19	0.15	15.2	0.1	15.0	0.07	14.9	1.3	129.0	1.33	135	1.36	142
20	0.15	15.2	0.1	15.0	0.07	14.9	1.31	131.0	1.36	142	1.31	131
21	0.12	15.1	0.12	15.1	0.07	14.9	1.22	113.0	1.4	152	1.3	129
22	0.12	15.1	0.12	15.1	0.13	15.1	1.18	105.0	1.41	154	1.28	125
23	0.15	15.2	0.12	15.1	0.21	15.6	1.19	107.0	1.41	154	1.28	125
24	0.12	15.1	0.12	15.1	0.24	16.0	1.14	97.7	1.43	159	1.31	131
25	0.12	15.1	0.12	15.1	0.23	15.8	1.1	90.3	1.41	154	1.35	140
26	0.12	15.1	0.12	15.1	0.21	15.6	1.1	90.3	1.38	147	1.48	172
27	0.12	15.1	0.12	15.1	0.21	15.6	1.12	94.0	1.36	142	1.34	137
28	0.12	15.1	0.1	15.0	0.21	15.6	1.08	87.0	1.61	206	1.32	133
29	0.12	15.1	....	....	0.19	15.4	1.2	109.0	1.58	198	1.3	129
30	0.12	15.1	....	....	0.19	15.4	1.22	113.0	1.48	172	1.33	135
31	0.1	15.0	....	....	0.21	15.6	....	....	1.38	147	....	....

	July.		August.		September.		October.		November.		December.	
1	1.36	142.0	1.09	88.6	0.62	32.9	0.48	24.5	0.60	31.5	....	16.2
2	1.36	142.0	1.05	82.2	0.60	31.5	0.70	39.6	0.60	31.5	0.25	16.2
3	1.34	137.0	1.05	82.2	0.59	30.8	0.60	31.5	0.58	30.1	0.22	15.7
4	1.32	133.0	1.01	76.1	0.58	30.1	0.59	30.8	0.55	28.3	0.22	15.7
5	1.34	137.0	1.00	74.6	0.55	28.3	0.59	30.8	0.60	31.5	0.22	15.7
6	1.38	147.0	0.92	63.6	0.55	28.3	0.53	27.1	0.42	21.6	0.22	15.7
7	1.42	157.0	0.90	61.0	0.56	28.9	0.50	25.5	0.48	24.5	0.22	15.7
8	1.34	137.0	0.88	58.6	0.55	28.3	0.48	24.5	0.45	23.0	0.22	15.7
9	1.31	131.0	0.86	56.2	0.55	28.3	0.48	24.5	0.50	25.5	....	15.8
10	1.29	127.0	0.83	52.7	0.70	39.6	0.46	23.5	0.46	23.5	0.24	16.0
11	1.23	115.0	0.81	50.5	0.59	30.8	0.45	23.0	0.40	20.8	0.22	15.7
12	1.18	105.0	0.80	49.4	0.58	30.1	0.48	24.5	0.50	25.5	0.20	15.5
13	1.26	121.0	0.80	49.4	0.55	28.3	0.48	24.5	....	23.9	....	15.5
14	1.24	117.0	0.79	48.4	0.55	28.3	0.48	24.5	....	22.3	0.20	15.5
15	1.32	133.0	0.76	45.4	0.56	28.9	0.45	23.0	0.40	20.8	0.18	15.4
16	1.34	137.0	0.79	48.4	0.58	30.1	0.42	21.6	0.40	20.8	0.18	15.4
17	1.31	131.0	0.78	47.4	0.56	28.9	0.40	20.8	0.38	20.0	0.18	15.4
18	1.34	137.0	0.75	44.4	0.55	28.3	0.45	23.0	0.38	20.0	0.15	15.2
19	1.32	133.0	0.75	44.4	0.55	28.3	0.54	27.7	0.34	18.7	0.15	15.2
20	1.29	127.0	1.06	83.8	0.52	26.5	0.48	24.5	0.31	17.8	0.15	15.2
21	1.26	121.0	0.90	61.0	0.50	25.5	0.51	86.0	....	17.7	0.15	15.2
22	1.24	117.0	0.81	50.5	0.47	24.0	0.52	26.5	....	17.6	0.15	15.2
23	1.21	111.0	0.79	48.4	0.47	24.0	0.52	26.5	0.30	17.5	0.15	15.2
24	1.20	109.0	0.76	45.4	0.62	32.9	0.52	26.5	0.30	17.5	0.12	15.1
25	1.18	105.0	0.73	42.4	0.56	28.9	0.51	26.0	0.30	17.5	0.12	15.1
26	1.15	99.5	0.71	40.5	0.52	26.5	0.60	31.5	0.28	16.9	0.12	15.1
27	1.20	109.0	0.70	39.6	0.52	26.5	0.61	32.2	0.28	16.9	0.12	15.1
28	1.16	101.0	0.68	37.8	0.48	24.5	0.65	35.3	....	16.9	0.12	15.1
29	1.14	97.7	0.66	36.1	0.45	23.0	0.65	35.3	0.28	16.9	0.12	15.1
30	1.11	92.1	0.65	35.3	0.45	23.0	0.65	35.3	0.25	16.2	0.10	15.0
31	1.11	92.1	0.64	34.5	....	....	0.65	35.3	....	....	0.10	15.0

Monthly Discharge of Silverton Creek at Silverton (Above Intake) for 1915.

(Drainage area, 30 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	15.5	15.0	15.3	0.51	0.59	941
February	15.1	15.0	15.1	0.50	0.52	839
March	16.0	14.8	15.1	0.50	0.58	928
April	131.0	15.6	68.4	2.28	2.54	4,070
May	206.0	105.0	144.0	4.80	5.53	8,850
June	172.0	121.0	141.0	4.70	5.24	8,390
July	157.0	92.1	123.0	4.10	4.73	7,560
August	88.6	34.5	54.2	1.81	2.09	3,330
September	39.6	23.0	28.5	0.95	1.06	1,700
October	39.6	20.8	27.6	0.92	1.06	1,700
November	31.5	16.2	21.7	0.72	0.80	1,290
December	16.2	15.0	15.4	0.51	0.59	947
The year	206.0	14.8	55.8	1.86	25.33	40,545

SLOCAN RIVER.—(3018).

Location.—The section is located at a highway bridge about a mile from the mouth of the river and near Crescent valley.

Records Available.—1913-14-15.

Drainage Area.—One thousand three hundred square miles.

Climatic Conditions.—Similar to Nelson (see Kootenay river, Nelson).

Gauge.—A vertical staff, nailed to bridge pier. Read by Mr. R. T. Symms.

Channel.—Straight above and below section. Inclined to shift. One side of the channel often filled with logs. Control not satisfactory.

Discharge Measurements.—Seven measurements were made in 1913, five in 1914, and four in 1915.

Accuracy.—"B." Results are not published during April, May, June, July, August and September, as the gauge readings are not relative to the discharge, due to the lumber company sluicing logs at their plant below the gauging station. Results published are considered within 10 per cent.

Discharge Measurements of Slocan River at Crescent Valley (For Curve) for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Nov. 8	Webb & Richardson	1,048	237	652	2.47	4.40	1,600
1914							
Mar. 6	Richardson	1,672	210	470	1.91	3.45	897
May 30	Elliott	1,909	219	1,470	5.43	8.10	7,980
Aug. 13	Richardson & Beeston	1,927	224	845	3.01	5.10	2,540
Nov. 10	Elliott	1,909	132	579	4.11	4.82	2,380
Dec. 9	Elliott & Beeston	1,929	128	468	2.62	3.95	1,230
1915							
Feb. 24	Beeston	1,929	212	339	2.07	3.10	703[1]
May 5	Richardson	1,929	229	1,170	4.56	6.75	5,340[1]
June 3	Dempster	1,909	230	1,450	3.75	7.80	5,420[1]
July 30	Dempster	1,927	229	1,300	3.49	6.50	4,540[1]

[1] Logs in Channel.

Daily Gauge Height and Discharge of Slocan River at Crescent Valley for 1915.

(Drainage area, 1,300 square miles.)

Day.	January.		February.		March.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.3	800	3.1	700	3.1	700	3.3	800	....	850	3.3	800
2	3.3	800	3.1	700	3.1	700	3.3	800	3.4	850	3.2	750
3	3.3	800	3.1	700	3.1	700	3.4	850	3.4	850	3.3	800
4	3.3	800	3.1	700	3.1	700	3.4	850	3.4	850	3.2	750
5	3.3	800	3.1	700	3.1	700	3.3	800	....	850	3.3	800
6	3.3	800	3.1	700	3.1	700	3.3	800	....	850	3.2	750
7	3.3	800	3.1	700	3.1	700	3.3	800	3.4	850	3.2	750
8	3.3	800	3.1	700	3.1	700	3.3	800	3.4	850	3.3	800
9	3.3	800	3.1	700	3.1	700	3.3	800	3.4	850	3.3	800
10	3.3	800	3.1	700	3.1	700	3.3	800	3.4	850	3.3	800
11	3.3	800	3.1	700	3.1	700	3.3	800	3.4	850	3.3	800
12	3.2	750	3.1	700	3.1	700	3.3	800	3.4	850	3.3	800
13	3.2	750	3.1	700	3.1	700	3.3	800	3.3	800	3.3	800
14	3.2	750	3.1	700	3.1	700	3.3	800	3.3	800	3.2	750
15	3.2	750	3.1	700	3.1	700	3.3	800	3.3	800	3.2	750
16	3.2	750	3.1	700	3.1	700	3.3	800	3.3	800	3.2	750
17	3.2	750	3.1	700	3.2	750	3.3	800	3.3	800	3.2	750
18	3.2	750	3.1	700	3.2	750	3.3	800	3.3	800	3.2	750
19	3.2	750	3.1	700	3.2	750	3.3	800	3.3	800	3.2	750
20	3.2	750	3.1	700	3.2	750	3.3	800	3.3	800	3.2	750
21	3.2	750	3.1	700	3.3	800	3.3	800	3.3	800	3.2	750
22	3.2	750	3.1	700	3.3	800	3.3	800	3.3	800	3.2	750
23	3.2	750	3.1	700	....	810	3.3	800	3.3	800	3.2	750
24	3.1	700	3.1	700	....	825	3.3	800	3.3	800	3.2	750
25	3.1	700	3.1	700	....	835	3.3	800	3.3	800	3.2	750
26	3.1	700	3.1	700	3.4	850	3.3	800	3.3	800	3.2	750
27	3.1	700	3.1	700	3.4	850	3.4	850	3.3	800	3.3	800
28	3.1	700	3.1	700	3.4	850	3.4	850	3.3	800	3.3	800
29	3.1	700	....	....	3.4	850	3.4	850	3.3	800	3.3	800
30	3.1	700	....	....	3.4	850	....	850	3.3	800	3.3	800
31	3.1	700	....	....	....	850	....	850	....	....	3.3	800

Monthly Discharge of Slocan River at Crescent Valley for 1915.

(Drainage area, 1,300 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	800	700	755	0.58	0.67	46,400
February	700	700	700	0.54	0.56	38,900
March....	850	700	754	0.58	0.67	46,400
October...	850	800	811	0.62	0.72	49,900
November.	850	800	820	0.63	0.70	48,800
December...	800	750	773	0.59	0.68	47,500
The period.	850	700	769	0.59	4.00	277,900

NOTE.—Owing to peculiar conditions below the gauging section the gauge readings for April to September are in doubt. The results for the months given are thought to be fairly accurate.

REVELSTOKE DISTRICT.

AKOLKOLEX RIVER.—(3000).

Location.—The station is in section 35, township 22, range 1, west of the 6th meridian, about one mile from Wigwam, at the bridge where wagon road crosses the river above the falls.

Records Available.—1913-14-15.

Drainage Area.—One hundred and five square miles.

Climatic Conditions.—Summers hot and moderately dry. Heavy snowfall during winters. Thermometer rarely goes below zero. Stream at section seldom freezes, except for a day or two. Anchor ice seldom forms for more than one or two days at a time.

Gauge.—Chain gauge used. Gauge readings taken three times a week, from May to October, inclusive, for the balance of the year one reading a week. J. A. Lewis, gauge reader, Wigwam.

Channel.—Straight for 100 yards above and below section. Current swift through box canyon. Control is rock and appears permanent.

Accuracy.—"B," "C" and "D." Accurate measurements were made, but as gauge readings are not daily the mean monthly discharge cannot be guaranteed closer than 15 per cent.

Discharge Measurements of Akolkolex River at Wigwam (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
May 7	Richardson & Elliott	1,048	37	157	2.56	2.35	402
May 30	Elliott	1,672	37	363	7.43	7.50	2,700
June 27	Elliott	1,672	37	314	6.40	6.45	2,110
July 17	Elliott	1,672	37	268	4.98	4.90	1,340
Aug. 13	Elliott	1,672	37	235	4.37	4.28	1,070
Sept. 16	Swan & Richardson	1,048	39	186	2.92	3.10	530
Nov. 20	Webb	1,048	29	106	1.71	1.60	180
1914							
Mar. 18	Webb	1,048	30	95	1.48	1.40	141
May 19	Elliott	1,909	37	312	5.34	6.10	1,670
June 26	Elliott	1,672	36	275	4.95	5.30	1,360
July 24	Elliott	1,909	35	239	3.88	4 30	929
Aug. 10	Elliott	1,909	37	190	2.82	3 10	537
Sept. 6	Richardson & Elliott	1,927	40	171	2.18	2.40	373
Oct. 10	Elliott	1,909	37	151	2.18	2.18	329
1915							
Mar. 18	Corbould	1,927	36	116	1.19	1.20	138
May 14	Dempster	1,929	39.5	250	4.60	4.80	1,150
Oct. 28	Richardson	1,929	43	210	3.28	3.56	689
Nov. 30	Richardson	1,929	39	140	1.45	1.60	202

Daily Gauge Height and Discharge of Akolkolex River at Wigwam for 1915.

(Drainage area, 105 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	159	....	156	0.9	103	....	281	....	1,040	....	1,180
2	....	168	....	149	....	104	....	328	....	1,050	5.0	1,180
3	....	177	....	142	....	105	2.5	375	....	1,060	....	1,180
4	1.5	187	1.15	135	....	107	....	400	4.75	1,080	5.0	1,180
5	....	177	....	134	0.95	109	....	425	....	1,280	....	1,270
6	....	167	....	133	....	107	....	450	....	1,490	5.4	1,360
7	1.3	157	....	132	....	105	....	475	6.1	1,690	....	1,290
8	....	156	....	131	....	104	3.0	500	....	1,790	....	1,210
9	....	155	....	130	0.9	103	....	482	....	1,890	4.9	1,140
10	....	154	1.1	129	....	103	....	464	6.7	1,990	....	1,090
11	....	153	....	127	....	103	2.8	447	....	1,770	....	1,050
12	....	152	....	125	0.9	103	....	554	....	1,540	4.55	1,000
13	....	151	....	123	....	111	3.55	661	....	1,320	4.6	1,020
14	1.25	150	....	121	....	119	....	682	4.8	1,100	....	1,150
15	....	140	....	119	....	127	....	704	....	1,110	....	1,290
16	....	130	....	117	1.15	135	3.75	726	....	1,120	5.55	1,420
17	....	120	....	116	....	138	....	829	....	1,130	....	1,370
18	....	111	1.0	115	1.2	142	....	932	4.9	1,140	5.3	1,310
19	....	102	....	113	....	162	....	1,040	....	1,270	....	1,290
20	....	93	....	111	....	182	4.9	1,140	....	1,410	5.2	1,270
21	....	84	....	109	....	202	....	1,010	5.8	1,540	....	1,280
22	0.6	75	....	107	....	223	....	874	....	1,520	5.25	1,290
23	....	90	....	105	1.85	244	3.8	742	....	1,490	....	1,480
24	....	105	....	104	....	228	....	734	....	1,470	....	1,670
25	....	120	0.9	103	....	212	....	725	5.6	1,450	6.45	1,860
26	....	135	....	103	1.55	194	....	717	....	1,560	....	1,660
27	....	150	....	103	....	204	3.7	709	....	1,680	....	1,470
28	....	165	....	103	....	211	....	813	6.3	1,790	5.2	1,270
29	1.45	180	....	....	....	219	....	916	....	1,480	....	1,280
30	....	172	....	....	....	227	4.6	1,020	5.0	1,180	....	1,290
31	....	164	....	....	1.8	235	....	....	....	1,180	....	....

	July.		August.		September.		October.		November.		December.	
1	....	1,300	....	1,310	3.25	570	2.1	289	....	422	1.6	202
2	5.3	1,310	....	1,270	....	631	....	266	2.7	422	....	202
3	....	1,310	5.1	1,220	3.65	693	1.85	244	....	395	....	202
4	5.3	1,310	....	1,170	....	596	....	248	....	368	1.6	202
5	....	1,360	....	1,110	3.0	500	1.9	252	2.35	341	....	200
6	5.5	1,400	4.7	1,060	....	426	....	241	....	322	....	198
7	5.9	1,590	....	1,150	2.4	352	....	230	....	303	....	196
8	....	1,680	5.15	1,240	....	320	....	220	....	284	1.55	194
9	6.25	1,760	....	1,090	2.1	289	1.65	210	2.0	270	....	194
10	....	1,670	4.4	949	....	270	....	215	....	262	....	194
11	....	1,570	....	905	1.9	252	....	220	....	254	1.55	194
12	5.65	1,480	4.15	862	....	252	1.75	226	....	246	....	192
13	....	1,510	....	1,020	....	252	....	218	....	238	....	190
14	....	1,530	5.0	1,180	1.9	252	....	210	....	231	....	189
15	5.85	1,560	....	1,180	....	270	1.6	202	....	224	....	188
16	....	1,510	....	1,180	2.1	289	....	231	1.65	210	1.5	187
17	....	1,450	5.0	1,180	....	310	....	260	....	218	....	185
18	5.5	1,400	....	929	....	331	....	290	....	226	....	183
19	....	1,310	3.6	677	2.4	352	2.25	320	1.8	235	....	181
20	5.1	1,220	....	688	....	318	....	327	....	230	1.45	180
21	....	1,270	....	699	....	285	....	334	....	226	....	182
22	....	1,330	3.7	709	1.9	252	2.35	341	....	222	....	184
23	5.45	1,380	....	885	....	252	....	361	1.7	218	1.5	187
24	....	1,380	4.7	1,060	1.9	252	....	381	....	212	....	177
25	....	1,180	....	948	....	243	....	401	....	206	....	167
26	4.75	1,080	....	837	1.8	235	2.7	422	....	210	....	157
27	....	1,050	3.75	726	....	218	....	550	1.55	194	....	147
28	....	1,020	....	702	1.6	202	3.6	677	....	196	....	138
29	4.5	985	3.6	677	....	227	....	592	....	198	1.1	129
30	....	1,170	....	641	1.9	252	....	507	....	200	....	129
31	5.4	1,360	....	605	....	....	2.7	422	....	....	....	129

Monthly Discharge of Akolkolex River at Wigwam for 1915.

(Drainage area, 105 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	187	75	142	1.35	1.56	8,730
February	156	103	121	1.15	1.20	6,720
March	244	103	154	1.47	1.70	9,220
April	1,140	281	672	6.40	7.14	40,000
May	1,990	1,040	1,410	13.40	15.40	86,700
June	1,860	1,000	1,290	12.30	13.70	79,300
July	1,760	985	1,370	13.00	14.50	84,000
August	1,310	605	963	9.17	10.60	59,200
September	693	202	331	3.15	3.51	19.700
October	677	202	320	3.05	3.52	19,700
November	422	194	260	2.47	2.76	15.500
December	202	129	180	1.71	1.97	11,100
The year	1,990	75	601	5.72	77.56	439.870

Blaeberry River.—(3002).

Location.—Section 29, township 28, range 22, west of 5th meridian, 11 miles north of Golden, about 1 mile from the mouth, on downstream side of C.P.R. bridge.

Records Available.—1912–13–14–15.

Drainage Area.—Three hundred and twenty-five square miles.

Climatic Conditions.—Summers hot and dry, with occasional heavy rains. Winters severe, with light snowfall. Ice conditions exist generally from November 15 to April 1.

Gauge.—Vertical staff, read three times a week by H. M. Cooper, until July, when chain gauge was established.

Channel.—Straight for 50 yards above and below station. Water runs swiftly and is controlled by a sand-bar, about 100 yards downstream. This bar probably shifts. Exceedingly high water on the Columbia may affect gauge readings.

Discharge Measurements.—Measurements are made from downstream side of railway bridge. 1915 data is compiled from one measurement in 1913, five in 1914, and five in 1915.

Accuracy.—"C." As gauge readings are not taken daily results are considered only within 15 per cent.

Discharge Measurements of Blaeberry River at Moberly (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height	Discharge.
1913			Feet.	Sq. ft.	Ft per sec	Feet.	Sec.-ft.
Nov. 30	Webb	1,048	52	154	1.38	0.50	212
1914							
June 12	Elliott	1,909	82	357	5.15	3.10	1,840
July 27	Elliott	1,909	78	323	3.96	2.60	1,280
Aug. 5	Elliott	1,909	78	322	4.53	2.80	1,460
Sept. 10	Elliott	1,927	78	230	2.50	1.75	573
Oct. 13	Elliott	1,909	66	188	2.19	1.30	412
1915							
Mar. 3	Corbould	1,927	69	104	0.55	Ice	57
May 6	Elliott	1,672	76	238	3.38	2.15	802
July 4	Elliott	1,909	82	332	6.34	3.28	2,110
July 13	Elliott	1,909	82	340	4.89	2.82	1,660
Oct. 21	Richardson	1,920	63	165	1.80	1.10	298

Daily Gauge Height and Discharge of Blaeberry River at Moberly for 1915.

(Drainage area, 325 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.5	207	1.8	600	2.5	1,160	3.5	2,440	3.0	1,720	2.6	1,260
2	....	214	1.9	660	2.6	1,260	3.3	2,140	....	1,850	....	1,160
3	0.6	220	....	695	....	1,310	3.3	2,140	3.2	1,980	2.4	1,060
4	....	228	2.0	730	2.7	1,360	3.3	2,140	3.1	1,850	2.3	965
5	0.7	236	....	848	....	1,310	3.4	2,290	3.4	2,290	2.4	1,060
6	....	246	2.3	965	2.6	1,260	3.5	2,440	3.1	1,850	....	970
7	0.8	256	2.5	1,160	2.5	1,160	3.6	2,600	3.0	1,720	2.2	880
8	....	236	2.9	1,600	....	1,110	3.5	2,440	....	1,660	....	805
9	0.6	220	3.0	1,720	2.4	1,060	3.4	2,290	2.9	1,600	2.0	730
10	....	228	....	1,540	....	1,010	3.2	1,980	3.1	1,850	....	730
11	0.7	236	2.7	1,360	2.3	965	3.0	1,720	3.2	1,980	2.0	730
12	0.7	236	....	1,120	2.2	880	3.0	1,720	3.2	1,980	....	640
13	....	246	2.2	880	2.4	1,060	2.8	1,480	....	1,850	1.7	550
14	0.8	256	....	800	....	1,110	3.4	2,290	3.0	1,720	....	505
15	1.1	324	2.0	730	2.5	1,160	3.2	1,980	3.1	1,850	1.5	460
16	....	357	2.2	880	2.6	1,260	3.3	2,140	....	1,920	....	460
17	1.3	390	2.0	730	....	1,490	3.3	2,140	3.2	1,980	1.5	460
18	1.5	460	....	765	3.0	1,720	3.2	1,980	3.1	1,850	1.4	425
19	1.6	505	2.1	800	3.1	1,850	3.3	2,140	3.3	2,140	....	465
20	....	460	....	840	3.1	1,850	3.5	2,440	....	2,000	1.6	505
21	1.4	425	2.2	880	3.0	1,720	3.6	2,600	3.1	1,850	1.3	390
22	....	443	2.4	1,060	....	1,850	3.5	2,440	3.5	2,440	....	425
23	1.5	460	2.5	1,160	3.2	1,980	3.4	2,290	3.4	2,290	1.5	460
24	....	482	....	1,260	....	2,060	3.3	2,140	....	2,000	....	442
25	1.6	505	2.7	1,360	3.3	2,140	....	2,290	3.0	1,720	1.4	425
26	1.4	425	....	1,360	4.5	4,160	3.5	2,440	3.0	1,720	....	408
27	....	443	2.7	1,360	4.5	4,160	3.4	2,290	3.1	1,850	1.3	390
28	1.5	460	....	1,310	4.5	4,160	....	2,140	2.8	1,480	....	372
29	....	560	2.6	1,260	4.2	3,630	3.2	1,980	....	1,810	1.2	355
30	1.9	660	....	1,260	3.8	2,940	3.3	2,140	3.3	2,140	....	372
31	....	....	....	1,160	....	....	3.1	1,850	2.9	1,600	....	....

	October.		November.									
1	1.3	390	1.2	355	....	....	....	....	....	....	....	....
2	....	425	....	372	....	....	....	....	....	....	....	....
3	1.5	460	1.3	390	....	....	....	....	....	....	....	....
4	....	442	....	408	....	....	....	....	....	....	....	....
5	1.4	425	1.4	425	....	....	....	....	....	....	....	....
6	1.2	355	1.1	324	....	....	....	....	....	....	....	....
7	....	340	....	312	....	....	....	....	....	....	....	....
8	1.1	324	1.0	300	....	....	....	....	....	....	....	....
9	....	324	....	312	....	....	....	....	....	....	....	....
10	1.1	324	1.1	324	....	....	....	....	....	....	....	....
11	....	340	0.9	279	....	....	....	....	....	....	....	....
12	1.2	355	....	268	....	....	....	....	....	....	....	....
13	....	328	0.8	256	....	....	....	....	....	....	....	....
14	1.0	300	....	256	....	....	....	....	....	....	....	....
15	....	345	0.8	256	....	....	....	....	....	....	....	....
16	1.3	390	....	268	....	....	....	....	....	....	....	....
17	1.2	355	0.9	279	....	....	....	....	....	....	....	....
18	....	390	1.1 Ice	264	....	....	....	....	....	....	....	....
19	1.4	425	....	250	....	....	....	....	....	....	....	....
20	....	374	0.7	236	....	....	....	....	....	....	....	....
21	1.1	324	....	228	....	....	....	....	....	....	....	....
22	1.2	355	0.6	220	....	....	....	....	....	....	....	....
23	....	355	....	228	....	....	....	....	....	....	....	....
24	1.2	355	0.7	236	....	....	....	....	....	....	....	....
25	....	390	....	228	....	....	....	....	....	....	....	....
26	1.4	425	0.6	220	....	....	....	....	....	....	....	....
27	....	390	....	213	....	....	....	....	....	....	....	....
28	1.2	355	0.5	207	....	....	....	....	....	....	....	....
29	....	372	....	204	....	....	....	....	....	....	....	....
30	1.3	390	....	200	....	....	....	....	....	....	....	....
31	....	372	Ice conditions		....	....	....	....	....	....	....	....

Monthly Discharge of Blaeberry River at Moberly for 1915.

(Drainage area, 325 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	660	207	354	1.09	1.22	21,100
May	1,720	600	1,060	3.26	3.76	65,200
June	4,160	880	1,800	5.54	6.18	107,000
July	2,600	1,480	2,180	6.71	7.74	134,000
August	2,440	1,480	1,890	5.81	6.70	116,000
September	1,260	355	628	1.93	2.15	37,400
October	460	300	371	1.14	1.31	22,800
November	425	200	277	0.85	0.95	16,500
The period	4,160	200	1,080	3.29	30.01	520,000

BUGABOO CREEK.—(3003).

Location.—About 3 miles south-west of Spillimacheen Landing, on down-stream side of highway bridge, 1 mile from mouth.

Records Available.—1912-13-14-15.

Drainage Area.—One hundred and ninety square miles.

Climatic Conditions.—Summers hot and dry. Winters severe, light snowfall. The creek usually freezes over in November and does not open again till April.

Gauge.—A vertical staff, nailed to pier of bridge, and read in the open season by Mr. Jas. Montgomery, daily.

Channel.—Straight, 100 feet above and below gauge. Current swift during freshet. One channel during low water and two at high water.

Discharge Measurements.—The 1915 rating curve is based on three measurements in 1912, six in 1913, three in 1914, and four in 1915.

Accuracy.—"B" and "C." The control is apparently permanent, daily readings are made, and the 1915 curve appears reliable. Above gauge height of 1.4 the results should be within 10 per cent, and below 1.4 15 per cent.

Discharge Measurements of Bugaboo Creek at Spillimacheen Landing (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
1912			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
June 1	Hughes	1,055	33.0	96.3	2.89	1.45	278
July 16	Hughes	1,055	59.0	128.0	5.34	2.15	684
Sept. 29	Richardson	1,055	33.0	86.0	1.87	1.02	161
1913							
May 20	Elliott	1,672	34.5	103.0	2.94	1.35	303
June 23	Elliott	1,672	60.0	152.0	6.88	2.40	1,040
July 11	Richardson	1,048	60.0	150.0	6.87	2.40	1,030
July 27	Elliott	1,672	60.0	158.0	6.66	2.38	1,050
July 30	Elliott	1,672	60.0	130.0	5.72	2.05	744
Sept. 3	Swan & Richardson	1,048	34.0	111.0	3.65	1.69	406
1914							
June 17	Elliott	1,909	60.0	187.0	10.20	3.00	1,910
July 31	Elliott	1,909	60.0	151.0	6.40	2.35	970
Oct. 23	Elliott	1,909	34.0	96.0	1.71	1.10	164
1915							
Feb. 28	Elliott & Corbould	1,927	34.0	73.6	0.69	0.50	50
May 3	Elliott	1,672	34.0	114.0	3.53	1.75	403
May 21	Elliott	1,672	34.0	116.0	4.09	1.87	477
Oct. 22	Richardson	1,929	34.0	89.4	1.56	1.12	140

Daily Gauge Height and Discharge of Bugaboo Creek at Galena for 1915.

(Drainage area, 190 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	....	......	....	......	....	0.58	62	1.9	489	1.8	423
2	......	....	......	....	......	....	0.62	65	1.8	423	1.9	489
3	......	....	......	....	......	....	0.9	99	1.78	411	2.0	563
4	......	....	......	....	......	....	0.9	99	1.7	355	1.9	489
5	......	....	......	....	......	....	0.82	87	1.7	365	2.08	631
6	......	....	......	....	......	....	0.8	84	1.72	377	2.0	563
7	......	....	......	....	......	....	0.85	92	1.9	489	2.25	803
8	......	....	......	....	......	....	0.92	103	2.12	668	2.15	697
9	......	....	......	....	......	....	0.85	92	2.15	697	1.98	548
10	......	....	......	....	......	....	0.82	87	2.25	803	1.85	456
11	......	....	......	....	......	....	0.9	99	2.05	606	1.8	423
12	......	....	......	....	......	....	1.0	117	1.85	456	1.85	456
13	......	....	......	....	......	....	1.1	139	1.82	436	1.9	489
14	......	....	......	....	......	....	1.12	144	1.8	423	1.95	526
15	......	....	......	....	......	....	1.12	144	1.7	365	2.15	697
16	......	....	......	....	......	....	1.22	172	1.63	329	2.3	860
17	......	....	......	....	0.5	56	1.38	224	1.6	314	2.4	982
18	......	....	......	....	0.5	56	1.48	263	1.65	340	2.15	697
19	......	....	......	....	0.5	56	1.58	305	1.68	355	2.1	648
20	......	....	......	....	0.5	56	1.6	314	1.6	314	2.0	563
21	......	....	......	....	0.55	60	1.58	305	1.85	456	2.0	563
22	......	....	......	....	0.6	63	1.32	204	2.0	563	2.1	648
23	......	....	......	....	0.65	67	1.3	197	1.95	526	2.2	746
24	......	....	......	....	0.6	63	1.38	224	1.88	476	2.3	860
25	......	....	......	....	0.6	63	1.3	197	1.87	469	2.6	1,250
26	......	....	......	....	0.65	67	1.32	204	1.88	476	2.7	1,390
27	......	....	......	....	0.6	63	1.35	214	1.9	489	2.35	921
28	......	....	......	....	0.62	65	1.25	182	2.0	563	2.25	803
29	......	....	......	....	0.55	60	1.4	231	2.0	563	2.2	746
30	......	....	......	....	0.58	62	1.72	377	1.95	526	2.3	860
31	......	....	......	....	0.6	63	......	....	1.85	456	......	....

	July.		August.		September.		October.		November.		December.	
1	2.4	982	2.75	1,460	2.05	606	1.35	214	1.10	139	Ice	....
2	2.45	1,050	2.7	1,390	1.95	526	1.35	214	1.08	134	Ice	....
3	2.4	982	2.6	1,250	2.0	563	1.20	166	1.10	139	Ice	....
4	2.5	1,110	2.6	1,250	2.1	648	1.12	144	1.00	117	Ice	....
5	2.6	1,250	2.5	1,110	1.92	504	1.15	152	1.02	121	Ice	....
6	2.7	1,390	2.48	1,080	1.9	489	1.20	166	0.85	92	Ice	....
7	2.7	1,390	2.55	1,180	1.75	394	1.05	128	0.90	99	1.45	250
8	2.65	1,320	2.55	1,180	1.6	314	1.02	121	0.90	99	1.30	197
9	2.4	982	2.5	1,110	1.55	292	1.08	134	1.00	117	0.95	108
10	2.3	860	2.4	982	1.45	250	1.02	121	0.92	103	0.95	108
11	2.2	746	2.35	921	1.38	224	1.05	128	0.80	84	Ice	....
12	2.0	563	2.45	1,050	1.32	204	1.00	117	0.70	72	Ice	....
13	2.2	746	2.45	1,050	1.28	191	1.05	128	0.60	63	Ice	....
14	2.35	921	2.4	982	1.25	182	1.02	121	0.90	99	1.10	139
15	2.3	860	2.4	982	1.22	172	0.98	113	0.90	99	0.65	63
16	2.2	746	2.4	982	1.3	197	0.92	103	1.00	117	0.80	84
17	2.28	837	2.4	982	1.35	214	0.95	108	0.95	108	0.90	99
18	2.35	921	2.5	1,110	1.32	204	1.05	128	0.90	99	0.85	92
19	2.4	982	2.22	769	1.65	340	1.25	182	0.92	103	0.95	108
20	2.42	1,010	2.3	860	1.38	224	1.10	139	0.90	99	1.00	117
21	2.5	1,110	2.28	837	1.28	191	1.12	144	0.90	99	1.00	117
22	2.6	1,250	2.2	746	1.3	197	1.10	139	0.85	92	0.90	99
23	2.55	1,180	2.3	860	1.28	191	1.10	139	1.05	128	0.80	84
24	2.4	982	2.35	921	1.25	182	1.12	144	1.10	139	0.85	92
25	2.45	1,050	2.3	860	1.3	197	1.10	139	1.20	166	0.90	99
26	2.38	958	2.25	803	1.2	166	1.08	134	1.05	128	0.75	78
27	2.38	958	2.32	884	1.32	204	1.30	197	1.05	128	0.75	78
28	2.35	921	2.25	803	1.28	191	1.35	214	1.15	152	0.80	84
29	2.65	1,320	2.32	884	1.18	161	1.28	191	1.50	270	0.90	99
30	2.5	1,110	2.32	884	1.28	191	1.20	166	1.85	....	Ice	....
31	2.6	1,250	2.3	860		. . .	1.15	152	Ice	. . . .	Ice	....

Monthly Discharge of Bugaboo Creek at Galena for 1915.

(Drainage area, 190 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	377	62	171	0.90	1.00	10,200
May	803	314	471	2.48	2.86	29,000
June	1,390	423	693	3.65	4.07	41,200
July	1,390	563	1,020	5.37	6.19	62,700
August	1,460	746	1,000	5.26	6.06	61,500
September	648	161	287	1.51	1.68	17,100
October	214	103	148	0.78	0.90	9,100
The period	1,460	62	541	2.85	22.76	232,800

COLUMBIA RIVER, GOLDEN.—(3005).

Location.—Station is in section 12, township 27, range 22, west of 5th meridian, 1 mile from Golden.

Records Available.—During the open season from 1903 to 1915. Gauge heights from 1903 to 1911 were obtained through the courtesy of the Columbia River Lumber Company. One ice measurement made in February, 1912, gave a discharge of 795 c.f.s., and one made in February, 1914, gave a discharge of 894 c.f.s.

Drainage Area.—Two thousand five hundred square miles.

Climatic Conditions.—Summers are warm and dry. Winters severe. Ice conditions generally exist from the middle of November till the end of March. Frazil ice is to be expected.

Gauge.—A vertical staff read daily during open season by Mr. J. T. Wood.

Channel.—The section is located in the middle of a straight stretch of river of 1,500 feet. At low water there is a pronounced riffle 300 yards below gauge, but this disappears at high water.

Discharge Measurements.—Measurements made from cable car. The 1915 rating curve is based on eighteen measurements made during 1911-12-13-14-15.

Accuracy.—"C." Gauge readings are good. 1915 results should be within 15 per cent.

Discharge Measurements of Columbia River at Golden (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Oct. 17	Richardson	1,048	176	792	2.36	10.8	1,870
1912							
June 4	Hughes	1,055	200	1,030	3.02	9.2	3,100
June 8	Hughes	1,055	220	1,270	3.52	8.1	4,490
June 24	Hughes	1,055	440	2,485	4.35	5.0	10,800
July 4	Hughes	1,055	385	1,910	4.60	5.3	8,820
July 28	Hughes	1,055	373	2,010	4.14	5.6	8,300
Oct. 1	Richardson	1,055	180	798	2.53	10.5	2,020
1913							
May 23	Elliott	1,672	200	1,060	3.42	3.7	3,620
June 16	Richardson	1,672	400	3,710	5.40	2.1	20,000
July 4	Richardson	1,672	400	2,690	4.20	4.0	11,300
Sept. 16	Elliott	1,672	270	1,280	4.17	8.1	5,340
Nov. 29	Webb	1,048	185	764	2.20	1.8	1,670
1914							
July 30	Elliott	1,909	390	2,540	4.09	7.95	10,400
Oct. 14	Elliott	1,909	200	855	2.65	2.48	2,260
1915							
Mar. 13	Corbould	1,927	164	1,420	0.67	0.50	957
May 7	Elliott	1,672	190	1,940	2.08	3.75	4,050
July 5	Elliott	1,909	200	2,460	3.73	7.20	9,200
Oct. 25	Richardson	1,929	168	1,540	1.14	1.58	1,750

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[1] Ice conditions.

Daily Gauge Height and Discharge of Columbia River at Golden for 1915.

(Drainage area, 2,500 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.2	1,260	2.6	2,400	5.0	5,420	7.1	8,630	7.6	9,540	7.0	8,470
2	1.3	1,320	2.95	2,780	4.9	5,280	7.1	8,630	7.68	9,690	6.95	8,390
3	1.6	1,520	3.75	3,740	4.9	5,280	7.1	8,630	7.82	9,960	6.9	8,310
4	1.68	1,580	4.25	4,390	5.0	5,420	7.15	8,720	7.9	10,100	6.85	8,230
5	1.75	1,640	4.25	4,390	5.1	5,560	7.2	8,800	8.0	10,300	6.75	8,070
6	1.7	1,600	4.2	4,320	5.2	5,700	7.25	8,890	8.1	10,500	6.62	7,860
7	1.65	1,560	4.2	4,320	5.3	5,840	7.3	8,980	8.15	10,600	6.52	7,700
8	1.6	1,520	4.28	4,430	5.4	5,990	7.38	9,120	8.15	10,600	6.38	7,480
9	1.6	1,520	4.65	4,930	5.5	6,140	7.52	9,390	8.1	10,500	6.28	7,320
10	1.57	1,500	5.0	5,420	5.6	6,290	7.68	9,690	8.15	10,600	6.08	7,010
11	1.57	1,500	5.3	5,840	5.5	6,140	7.7	9,730	8.0	10,300	5.7	6,440
12	1.6	1,520	5.5	6,140	5.3	5,840	7.75	9,820	7.95	10,200	5.15	5,630
13	1.6	1,520	5.6	6,290	5.3	5,840	7.8	9,920	7.9	10,100	4.35	4,520
14	1.72	1,620	5.4	5,990	5.2	5,700	7.8	9,920	7.9	10,100	3.55	3,500
15	1.82	1,700	5.2	5,700	5.0	5,420	7.8	9,920	7.9	10,100	3.2	3,080
16	1.92	1,780	4.8	5,140	5.2	5,700	7.82	9,960	7.85	10,000	3.1	2,960
17	2.02	1,860	4.55	4,800	5.35	5,920	....	9,940	7.8	9,920	2.95	2,780
18	2.72	2,530	4.3	4,460	5.75	6,520	7.8	9,920	7.8	9,920	2.82	2,640
19	2.95	2,780	4.12	4,220	6.0	6,890	7.8	9,920	7.75	9,820	2.8	2,620
20	3.1	2,960	4.1	4,190	6.02	6,920	7.8	9,920	7.7	9,730	2.8	2,620
21	3.22	3,100	4.1	4,190	6.1	7,040	7.75	9,820	7.7	9,730	2.8	2,620
22	3.32	3,220	4.25	4,390	6.18	7,160	7.7	9,730	7.65	9,640	2.8	2,620
23	2.95	2,780	4.38	4,560	6.2	7,190	7.65	9,640	7.6	9,540	2.8	2,620
24	2.85	2,680	4.65	4,930	6.22	7,220	7.6	9,540	7.55	9,440	2.75	2,560
25	2.8	2,620	4.85	5,210	6.32	7,380	7.6	9,540	7.48	9,310	2.75	2,560
26	2.8	2,620	4.9	5,280	6.7	7,990	7.6	9,540	7.4	9,160	2.7	2,510
27	2.8	2,620	4.9	5,280	6.88	8,280	7.65	9,640	7.4	9,160	2.65	2,460
28	2.75	2,560	4.9	5,280	6.95	8,390	7.65	9,640	7.3	8,980	2.62	2,420
29	2.75	2,560	4.92	5,310	7.0	8,470	7.62	9,580	7.25	8,890	2.6	2,400
30	2.7	2,510	5.0	5,420	7.08	8,600	7.6	9,540	7.2	8,800	2.55	2,350
31	....	....	5.05	5,490	....	....	7.6	9,540	7.1	8,630	....	....

Day.	October.		November.	
1	2.5	2,300	2.4	2,200
2	2.5	2,300	2.3	2,100
3	2.45	2,250	2.3	2,100
4	2.4	2,200	2.2	2,000
5	2.4	2,200	2.05	1,880
6	2.35	2,150	1.9	1,760
7	2.3	2,100	1.8	1,680
8	2.2	2,000	1.6	1,520
9	2.15	1,960	1.58	1,500
10	2.1	1,920	1.52	1,460
11	2.05	1,880	Frozen	....
12	1.9	1,760	....	....
13	1.9	1,760	....	....
14	1.9	1,760	....	....
15	1.9	1,760	....	....
16	1.9	1,760	....	....
17	1.85	1,720	....	....
18	1.85	1,720	....	....
19	1.85	1,720	....	....
20	1.85	1,720	....	....
21	1.8	1,680	....	....
22	1.8	1,680	....	....
23	1.8	1,680	....	....
24	1.8	1,680	....	....
25	1.8	1,680	....	....
26	1.88	1,740	....	....
27	2.0	1,840	....	....
28	2.1	1,920	....	....
29	2.22	2,020	....	....
30	2.3	2,100	....	....
31	2.4	2,200	....	....

Monthly Discharge of Columbia River at Golden for 1915.

(Drainage area, 2,500 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	3,220	1,260	2,070	0.83	0.93	123,000
May	6,290	2,400	4,810	1.93	2.22	296,000
June	8,600	5,280	6,520	2.61	2.91	388,000
July	9,960	8,630	9,490	3.80	4.38	584,000
August	10,600	8,630	9,800	3.92	4.52	603,000
September	8,470	2,350	4,690	1.88	2.10	288,000
October	2,300	1,680	1,910	0.76	0.88	117,000
The period	10,600	1,260	5,610	2.24	17.94	2,459,000

COLUMBIA RIVER, REVELSTOKE.—(3007).

Location.—Section 33, township 23, range 2, west of 6th meridian, above the mouth of Illecillewaet river, on downstream side of highway bridge, at Revelstoke.

Records Available.—1912-13-14-15.

Drainage Area.—Nine thousand square miles.

Climatic Conditions.—Summers are hot, with considerable rainfall. Winters are fairly cold, with heavy snowfall. Frazil ice forms in large quantities.

Gauge.—Chain gauge read daily during open season. Mr. J. H. Jones read the gauge till September, Mr. S. Anderson thereafter.

Channel.—About 1,000 feet wide, controlled by a fairly permanent sand-bar.

Discharge Measurements.—1915 data is based on nine measurements during 1913 and 1914, and four during 1915.

Accuracy.—"A" and "B." Accurate gauge readings and fair conditions for metering. Results are considered to be within 5 and 10 per cent.

Discharge Measurements of Columbia River at Revelstoke (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
May 5	Elliott	1,048	705	5,040	2.40	5.60	12,300
May 26	Elliott	1,048	840	10,000	6.02	12.82	61,800
June 7	Elliott	1,048	1,050	13,400	7.60	16.30	102,000
Sept. 17	Elliott	1,048	825	7,340	4.33	9.20	31,800
1914							
May 20	Elliott	1,672	835	8,190	5.93	11.60	48,500
June 25	Elliott	1,909	846	11,500	6.38	13.20	73,600
Sept. 7	Elliott	1,927	825	7,940	4.75	9.50	37,700
Oct. 8	Richardson	1,909	710	5,750	3.18	7.00	18,300
Nov. 18	Elliott	1,909	705	4,210	2.66	5.10	11,200
1915							
Jan. 6	Corbould	1,909	735	4,130	1.82	4.65	7,510[1]
Mar. 17	Corbould	1,927	705	3,770	1.60	3.70	5,950
May 11	Dempster	1,929	847	11,000	6.78	13.50	74,700
Nov. 30	Richardson	1,929	702	4,500	1.84	4.20	8,280

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[1] Ice conditions.

Daily Gauge Height and Discharge of Columbia River at Revelstoke for 1915.

(Drainage area, 9,000 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	4.7	9,600	8.6	29,200	10.7	45,200	14.5	80,500	14.9	84,900	....	62,900
2	5.9	14,000	8.6	29,200	11.0	47,800	14.7	82,700	15.2	88,200	....	60,000
3	6.2	15,200	9.1	32,700	11.0	47,800	14.5	80,500	16.1	98,000	....	57,000
4	6.3	15,700	9.5	35,600	11.1	48,600	14.3	78,500	16.2	99,000	....	54,100
5	6.1	14,800	9.9	38,800	11.4	51,000	14.5	80,500	15.9	95,900	....	51,200
6	6.0	14,400	10.6	44,400	11.6	52,700	14.9	84,900	15.0	86,000	....	48,300
7	6.0	14,400	11.4	51,000	12.5	60,800	15.2	88,200	15.4	90,400	....	45,400
8	6.0	14,400	12.5	60,800	12.3	59,000	15.5	91,500	15.5	91,500	....	42,500
9	5.9	14,000	13.1	66,600	11.8	54,500	15.0	86,000	15.3	89,300	....	39,600
10	5.8	13,600	13.9	74,500	11.0	47,800	14.7	82,700	15.0	86,000	....	36,700
11	5.8	13,600	13.6	71,500	10.4	42,800	14.0	75,500	15.1	87,100	....	33,800
12	6.0	14,400	13.0	65,700	10.7	45,200	13.1	66,600	15.0	86,000	....	30,900
13	6.5	16,700	12.0	56,300	10.8	46,000	12.6	61,700	15.0	86,000	....	27,900
14	6.6	17,200	11.4	51,000	11.3	50,200	12.9	64,700	15.1	87,100	....	25,000
15	6.8	18,200	11.1	48,600	12.0	56,300	14.1	76,500	15.2	88,200	....	22,100
16	6.9	18,700	10.7	45,200	12.6	61,700	14.3	78,500	15.3	89,300	7.0	19,200
17	7.3	20,800	10.2	41,200	13.9	74,500	14.0	75,500	15.1	87,100	7.2	20,200
18	7.9	24,400	10.5	43,600	13.6	71,500	13.9	74,500	15.0	86,000	7.1	19,700
19	8.3	27,100	10.6	44,400	13.0	65,700	13.6	71,500	14.9	84,900	7.8	23,800
20	8.5	28,500	11.4	51,000	12.8	63,700	13.9	74,500	14.9	84,900	7.4	21,400
21	8.4	27,800	12.1	57,200	12.9	64,700	14.2	77,500	15.2	88,200	6.9	18,700
22	8.2	26,400	12.8	63,700	13.0	65,700	14.6	81,600	15.3	89,300	6.8	18,200
23	8.0	25,000	12.8	63,700	13.3	68,500	14.3	78,500	15.1	87,100	6.8	18,200
24	7.9	24,400	12.5	60,800	13.6	71,500	14.3	78,500	15.1	87,100	6.6	17,200
25	7.7	23,200	12.3	59,000	13.8	73,500	14.2	77,500	15.0	86,000	6.4	16,200
26	7.8	23,800	12.0	56,300	14.9	84,900	14.0	75,500	14.9	84,900	6.3	15,700
27	7.6	22,600	11.8	54,500	14.6	81,600	13.9	74,500	13.9	74,500	6.4	16,200
28	7.9	24,400	12.0	56,300	14.4	79,500	14.1	76,500	13.9	74,500	6.3	15,700
29	8.9	31,300	12.2	58,100	14.3	78,500	14.2	77,500	....	71,600	6.2	15,200
30	8.6	29,200	11.5	51,800	14.3	78,500	14.2	77,500	....	68,700	6.2	15,200
31	....	....	10.9	46,900	....	....	14.4	79,500	....	65,800	....	....

Day.	October.		November.		December.	
1	6.0	14,400	6.7	17,700	4.2	8,100
2	5.9	14,000	6.6	17,200	4.2	8,100
3	5.8	13,600	6.4	16,200	4.1	7,900
4	5.7	13,200	6.2	15,200	4.2	8,100
5	5.7	13,200	6.2	15,200	4.3	8,400
6	5.6	12,800	6.0	14,400	4.3	8,400
7	5.6	12,800	5.8	13,600	4.4	8,700
8	5.5	12,400	5.7	13,200	4.5	9,000
9	5.4	12,000	5.6	12,800	4.5	9,000
10	5.3	11,600	5.4	12,000	4.4	8,700
11	5.3	11,600	5.3	11,600	4.3	8,400
12	5.2	11,200	5.2	11,200	4.2	8,100
13	5.2	11,200	4.8	9,900	4.2	8,100
14	5.4	12,000	4.8	9,900	4.1	7,900
15	5.2	11,200	4.8	9,900	4.1	7,900
16	5.1	10,800	4.9	10,200	4.1	7,900
17	5.1	10,800	4.9	10,200	4.0	7,700
18	5.5	12,400	4.8	9,900	4.0	7,700
19	6.3	15,700	4.8	9,900	4.0	7,700
20	6.0	14,400	4.8	9,900	4.0	7,700
21	6.2	15,200	4.8	9,900	4.1	7,900
22	6.2	15,200	4.8	9,900	4.1	7,900
23	6.2	15,200	4.7	9,600	4.1	7,900
24	6.4	16,200	4.6	9,300	4.0	7,700
25	6.2	15,200	4.6	9,300	4.1	7,900
26	6.4	16,200	4.7	9,600	4.2	8,100
27	7.1	19,700	4.6	9,300	4.1	7,900
28	7.2	20,200	4.5	9,000	4.0	7,700
29	7.2	20,200	4.4	8,700	4.0	7,700
30	7.0	19,200	4.3	8,400	4.0	7,700
31	6.8	18,200	....	....	4.0	7,700

Monthly Discharge of Columbia River at Revelstoke for 1915.

(Drainage area, 9,000 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	31,300	9,600	19,900	2.21	2.47	1,180,000
May	74,500	29,200	51,900	5.77	6.65	3,190,000
June	84,900	42,800	61,300	6.81	7.60	3,650,000
July	91,500	61,700	77,700	8.63	9.95	4,780,000
August	99,000	65,800	85,600	9.51	11.00	5,260,000
September	62,900	15,200	30,300	3.37	3.76	1,800,000
October	20,200	10,800	14,300	1.59	1.83	879,000
November	17,700	8,400	11,400	1.27	1.42	678,000
December	9,000	7,700	8,050	0.89	1.03	495,000
The period	99,000	7,700	40,050	4.45	45.71	21,912,000

NOTE.—No gauge readings were made from August 29 to September 16. The discharges were interpolated by referring to gauge at Arrowhead. No accuracy is given for September.

FIELD SPRINGS 1, 2, 3.—(3062, 3063, 3064).

Location.—In township 28, range 18, west of 5th meridian, about ¼ mile east of C.P.R. hotel, at Field.

Records Available.—October 16 to December 31, 1914, and all of 1915.

Drainage Area.—Not determined.

Climatic Conditions.—In summer the days are usually hot and the nights cool, June is generally a wet month, July and August dry ones. In winter the snow generally falls in October or November and remains till April.

Discharge Measurements.—Discharges are obtained from these springs by means of weirs. There are three weirs and readings were taken daily at the different gauges on Nos. 1 and 2 throughout the year, and at No. 3. from the first of April till the end of the year, by Messrs. Jackson and Bell. These weirs were established to determine the water supply for Field and the C.P.R. shops.

Daily Gauge Height and Discharge of Field Springs at Field (Weir No. 1) for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.07	0.046	0.09	0.067	0.08	0.056	0.10	0.079	0.43	0.704	0.36	0.539
2	0.07	0.046	0.09	0.067	0.08	0.056	0.11	0.091	0.44	0.729	0.40	0.631
3	0.07	0.046	0.09	0.067	0.08	0.056	0.11	0.091	0.45	0.754	0.38	0.585
4	0.07	0.046	0.09	0.067	0.08	0.056	0.14	0.131	0.45	0.754	0.34	0.495
5	0.07	0.046	0.09	0.067	0.08	0.056	0.20	0.223	0.45	0.754	0.30	0.410
6	0.07	0.046	0.10	0.079	0.08	0.056	0.18	0.191	0.45	0.754	0.28	0.370
7	0.07	0.046	0.10	0.079	0.07	0.046	0.19	0.207	0.45	0.754	0.30	0.410
8	0.07	0.046	0.09	0.067	0.07	0.046	0.20	0.223	0.45	0.754	0.33	0.473
9	0.07	0.046	0.09	0.067	0.07	0.046	0.20	0.223	0.45	0.754	0.32	0.452
10	0.07	0.046	0.09	0.067	0.07	0.046	0.19	0.207	0.50	0.883	0.30	0.410
11	0.07	0.046	0.09	0.067	0.07	0.046	0.19	0.207	0.49	0.856	0.29	0.390
12	0.09	0.067	0.09	0.067	0.07	0.046	0.19	0.207	0.44	0.729	0.28	0.370
13	0.10	0.079	0.10	0.079	0.07	0.046	0.20	0.223	0.46	0.779	0.28	0.370
14	0.11	0.091	0.10	0.079	0.07	0.046	0.22	0.258	0.45	0.754	0.28	0.370
15	0.11	0.091	0.10	0.079	0.07	0.046	0.24	0.294	0.49	0.856	0.28	0.370
16	0.11	0.091	0.10	0.079	0.07	0.046	0.28	0.370	0.40	0.631	0.30	0.410
17	0.11	0.091	0.09	0.067	0.07	0.046	0.34	0.495	0.40	0.631	0.38	0.585
18	0.12	0.104	0.09	0.067	0.07	0.046	0.42	0.679	0.40	0.631	0.34	0.495
19	0.12	0.104	0.10	0.079	0.07	0.046	0.41	0.655	0.40	0.631	0.45	0.754
20	0.11	0.091	0.09	0.067	0.07	0.046	0.42	0.679	0.26	0.331	0.58	1.103
21	0.10	0.079	0.08	0.056	0.08	0.056	0.40	0.631	0.26	0.331	0.56	1.047
22	0.10	0.079	0.08	0.056	0.09	0.067	0.38	0.585	0.28	0.370	0.52	0.936
23	0.10	0.079	0.09	0.067	0.10	0.079	0.36	0.539	0.28	0.370	0.48	0.830
24	0.10	0.079	0.08	0.056	0.10	0.079	0.39	0.608	0.28	0.370	0.44	0.729
25	0.10	0.079	0.09	0.067	0.10	0.079	0.36	0.539	0.28	0.370	0.50	0.883
26	0.10	0.079	0.08	0.056	0.10	0.079	0.34	0.495	0.29	0.390	....	0.848
27	0.10	0.079	0.08	0.056	0.10	0.079	0.34	0.495	0.28	0.370	....	0.823
28	0.10	0.079	0.08	0.056	0.10	0.079	0.35	0.517	0.28	0.370	....	0.787
29	0.10	0.079	....	....	0.10	0.079	0.36	0.539	0.29	0.390	....	0.752
30	0.10	0.079	....	....	0.11	0.091	....	0.622	0.29	0.390	....	0.716
31	0.09	0.067	....	....	0.11	0.091	....	....	0.31	0.431	....	....

	July.		August.		September.		October.		November.		December.	
1	....	0.681	0.23	0.276	0.10	0.079	0.07	0.046	0.10	0.079	0.07	0.046
2	....	0.646	0.22	0.258	0.10	0.079	0.07	0.046	0.10	0.079	0.07	0.046
3	....	0.610	0.23	0.276	0.11	0.091	0.06	0.037	0.10	0.079	0.07	0.046
4	....	0.575	0.20	0.223	0.10	0.079	0.07	0.046	0.09	0.067	0.07	0.046
5	0.36	0.539	0.18	0.191	0.09	0.067	0.07	0.046	0.09	0.067	0.07	0.046
6	0.44	0.729	0.18	0.191	0.09	0.067	0.06	0.037	0.09	0.067	0.07	0.046
7	0.42	0.679	0.18	0.191	0.10	0.079	0.06	0.037	0.08	0.056	0.07	0.046
8	0.50	0.883	0.17	0.175	0.10	0.079	0.06	0.037	0.09	0.067	0.07	0.046
9	0.56	1.047	0.17	0.175	0.12	0.104	0.06	0.037	0.08	0.056	0.07	0.046
10	0.57	1.075	0.16	0.160	0.10	0.079	0.06	0.037	0.07	0.046	0.07	0.046
11	0.59	1.132	0.16	0.160	0.09	0.067	0.06	0.037	0.06	0.037	0.07	0.046
12	0.59	1.132	0.15	0.145	0.09	0.067	0.06	0.037	0.06	0.037	0.07	0.046
13	0.62	1.219	0.15	0.145	0.08	0.056	0.05	0.028	0.06	0.037	0.07	0.046
14	0.64	1.280	0.14	0.131	0.08	0.056	0.05	0.028	0.06	0.037	....	0.040
15	0.66	1.340	0.14	0.131	0.07	0.046	0.05	0.028	0.06	0.037	....	0.034
16	0.64	1.280	0.14	0.131	0.09	0.067	0.05	0.028	0.06	0.037	0.05	0.028
17	0.64	1.280	0.14	0.131	0.09	0.067	0.05	0.028	0.07	0.046	0.05	0.028
18	0.66	1.340	0.14	0.131	0.11	0.091	0.07	0.026	0.06	0.037	0.05	0.028
19	0.62	1.219	0.14	0.131	0.13	0.117	0.06	0.037	0.06	0.037	0.05	0.028
20	0.60	1.160	0.14	0.131	0.12	0.104	0.06	0.037	0.06	0.037	0.05	0.028
21	0.56	1.047	0.14	0.131	0.10	0.079	0.06	0.037	0.07	0.046	0.06	0.037
22	0.50	0.883	0.13	0.117	0.09	0.067	0.06	0.037	....	0.046	0.06	0.037
23	0.46	0.779	0.15	0.145	0.10	0.079	0.07	0.047	....	0.046	0.06	0.037
24	0.40	0.631	0.13	0.117	0.09	0.067	0.08	0.056	....	0.046	0.05	0.028
25	0.37	0.562	0.12	0.104	0.08	0.056	0.07	0.046	....	0.046	....	0.025
26	0.34	0.495	0.12	0.104	0.07	0.046	0.07	0.046	....	0.046	....	0.022
27	0.35	0.517	0.11	0.091	0.07	0.046	0.08	0.056	....	0.046	0.04	0.020
28	0.30	0.410	0.10	0.079	0.07	0.046	0.09	0.067	....	0.046	0.04	0.020
29	0.28	0.370	0.10	0.079	0.07	0.046	0.09	0.067	0.07	0.046	0.04	0.020
30	0.26	0.331	0.10	0.079	0.08	0.056	0.10	0.079	0.07	0.046	0.04	0.020
31	0.24	0.294	0.10	0.079	....	....	0.10	0.079	....	....	0.04	0.020

Monthly Discharge of Field Springs at Field (Weir No. 1) for 1915.

MONTH.	DISCHARGE				RUN-OFF.	
	1 Maximum.	2 Minimum.	3 Mean.	4 Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	56,200	24,800	0.070	37,800	....	....
February	42,700	30,200	0.068	36,700	....	....
March	49,100	24,800	0.059	31,900	....	....
April	367,000	42,700	0.377	204,000	....	....
May	477,000	179,000	0.599	323,000	....	....
June	596,000	200,000	0.611	330,000	....	....
July	724,000	159,000	0.844	456,000	....	....
August	149,000	42,700	0.149	80,500	....	....
September	63,200	24,800	0.071	38,300	....	....
October	42,700	15,100	0.044	23,800	....	....
November	42,700	20,000	0.050	27,000	....	....
December	24,800	10,800	0.035	18,900	....	....
The year	724,000	10,800	0.248	134,000	....	....

No. 1.—This column gives maximum daily flow, in gallons, for month.
No. 2.—This column gives minimum daily flow, in gallons, for month.
No. 3.—This column gives mean daily flow, in second-feet, for month.
No. 4.—This column gives mean daily flow, in gallons, for month.

Daily Gauge Height and Discharge of Field Springs at Field (Weir No. 2) for 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.15	0.304	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.29	0.803
2	0.15	0.304	0.14	0.274	0.14	0.274	0.13	0.245	0.14	0.274	0.29	0.803
3	0.15	0.304	0.14	0.274	0.14	0.274	0.13	0.245	0.14	0.274	0.29	0.803
4	0.15	0.304	0.14	0.274	0.14	0.274	0.13	0.245	0.14	0.274	0.28	0.763
5	0.15	0.304	0.14	0.274	0.13	0.245	0.13	0.245	0.14	0.274	0.28	0.763
6	0.15	0.304	0.14	0.274	0.13	0.245	0.13	0.245	0.16	0.334	0.29	0.803
7	0.15	0.304	0.14	0.274	0.13	0.245	0.14	0.274	0.17	0.366	0.29	0.803
8	0.15	0.304	0.14	0.274	0.14	0.274	0.14	0.274	0.18	0.398	0.3	0.844
9	0.15	0.304	0.14	0.274	0.14	0.274	0.13	0.245	0.2	0.464	0.3	0.844
10	0.15	0.304	0.14	0.274	0.13	0.245	0.13	0.245	0.2	0.464	0.29	0.803
11	0.15	0.304	0.14	0.274	0.13	0.245	0.13	0.245	0.22	0.534	0.28	0.763
12	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.23	0.571	0.29	0.803
13	0.14	0.274	0.14	0.274	0.13	0.245	0.14	0.274	0.24	0.608	0.3	0.844
14	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.23	0.571	0.3	0.844
15	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.23	0.571	0.3	0.844
16	0.13	0.245	0.14	0.274	0.13	0.245	0.12	0.218	0.24	0.608	0.31	0.885
17	0.14	0.274	0.13	0.245	0.13	0.245	0.12	0.218	0.24	0.684	0.31	0.885
18	0.14	0.274	0.13	0.245	0.13	0.245	0.12	0.218	0.26	0.684	0.3	0.844
19	0.14	0.274	0.14	0.274	0.13	0.245	0.12	0.218	0.26	0.646	0.32	0.926
20	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.25	0.646	0.32	0.926
21	0.13	0.245	0.14	0.274	0.13	0.245	0.13	0.245	0.26	0.684	0.31	0.885
22	0.13	0.245	0.14	0.274	0.13	0.245	0.12	0.218	0.27	0.723	0.3	0.844
23	0.13	0.245	0.14	0.274	0.13	0.245	0.12	0.218	0.28	0.763	0.3	0.844
24	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.29	0.803	0.29	0.803
25	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.29	0.803	0.32	0.926
26	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.29	0.803	0.39	1.240
27	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.28	0.763	0.37	1.140
28	0.14	0.274	0.14	0.274	0.13	0.245	0.13	0.245	0.28	0.763	0.36	1.100
29	0.14	0.274	....	....	0.13	0.245	0.13	0.245	0.28	0.763	0.35	1.060
30	0.14	0.274	....	....	0.13	0.245	0.14	0.274	0.28	0.763	0.34	1.010
31	0.14	0.274	....	....	0.13	0.245	....	....	0.29	0.803	....	....

	July.		August.		September.		October.		November.		December.	
1	0.39	1.240	0.37	1.140	0.29	0.803	0.25	0.646	0.23	0.571	0.21	0.498
2	0.37	1.140	0.37	1.140	0.29	0.803	0.25	0.646	0.23	0.571	0.20	0.464
3	0.37	1.140	0.37	1.140	0.3	0.844	0.25	0.646	0.22	0.534	0.20	0.464
4	0.41	1.320	0.36	1.100	0.29	0.803	0.25	0.646	0.22	0.534	0.20	0.464
5	0.45	1.520	0.35	1.050	0.28	0.763	0.25	0.646	0.22	0.534	0.20	0.464
6	0.45	1.520	0.34	1.010	0.28	0.763	0.24	0.608	0.22	0.534	0.20	0.464
7	0.44	1.470	0.34	1.010	0.29	0.803	0.25	0.646	0.22	0.534	0.20	0.464
8	0.43	1.420	0.33	0.967	0.29	0.803	0.24	0.608	0.22	0.534	0.20	0.464
9	0.43	1.420	0.33	0.967	0.29	0.803	0.24	0.608	0.22	0.534	0.20	0.464
10	0.42	1.370	0.33	0.967	0.28	0.763	0.24	0.608	0.22	0.534	0.20	0.464
11	0.43	1.420	0.34	1.010	0.27	0.723	0.23	0.571	0.22	0.534	0.20	0.464
12	0.41	1.320	0.33	0.967	0.27	0.723	0.23	0.571	0.21	0.498	0.20	0.464
13	0.42	1.370	0.32	0.926	0.26	0.684	0.28	0.571	0.21	0.498	0.20	0.464
14	0.43	1.420	0.32	0.926	0.25	0.646	0.22	0.534	0.21	0.498	....	0.464
15	0.44	1.470	0.32	0.926	0.25	0.646	0.22	0.534	0.22	0.534	....	0.464
16	0.41	1.320	0.32	0.926	0.25	0.646	0.22	0.534	0.21	0.498	0.20	0.464
17	0.40	1.280	0.32	0.926	0.25	0.646	0.22	0.534	0.22	0.534	0.20	0.464
18	0.39	1.240	0.32	0.926	0.26	0.684	0.23	0.571	0.21	0.498	0.20	0.464
19	0.39	1.240	0.32	0.926	0.26	0.684	0.22	0.534	0.21	0.498	0.20	0.464
20	0.39	1.240	0.32	0.926	0.26	0.684	0.22	0.534	0.21	0.498	0.20	0.464
21	0.39	1.240	0.32	0.926	0.26	0.684	0.22	0.534	0.21	0.498	0.20	0.464
22	0.38	1.190	0.31	0.885	0.25	0.646	0.22	0.534	....	0.498	0.20	0.464
23	0.39	1.240	0.32	0.926	0.26	0.684	0.23	0.571	....	0.498	0.20	0.464
24	0.39	1.240	0.31	0.885	0.26	0.684	0.23	0.571	....	0.498	0.20	0.464
25	0.39	1.240	0.31	0.885	0.25	0.646	0.23	0.571	......	0.498	..	0.464
26	0.38	1.190	0.31	0.885	0.25	0.646	0.23	0.571	......	0.498	..	0.498
27	0.39	1.240	0.3	0.844	0.26	0.684	0.23	0.571	....	0.498	0.21	0.498
28	0.37	1.140	0.3	0.844	0.25	0.646	0.23	0.571	0.21	0.498	0.21	0.498
29	0.37	1.140	0.3	0.844	0.25	0.646	0.23	0.571	0.21	0.498	0.20	0.464
30	0.37	1.140	0.3	0.844	0.26	0.684	0.22	0.534	0.21	0.498	0.20	0.464
31	0.38	1.190	0.29	0.803	..	....	0.22	0.534	....	.....	0.19	0.431

Monthly Discharge of Field Springs at Field (Weir No. 2) for 1915.

MONTH.	DISCHARGE.				RUN-OFF.	
	1 Maximum.	2 Minimum.	3 Mean.	4 Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	164,000	132,000	0.281	152,000	....	....
February	148,000	132,000	0.272	147,000	....	....
March	148,000	132,000	0.251	136,000	....	....
April	148,000	118,000	0.243	131,000	....	....
May	434,000	132,000	0.578	312,000	....	....
June	670,000	412,000	0.882	476,000	....	....
July	821,000	616,000	1.290	697,000	....	....
August	616,000	434,000	0.950	513,000	....	....
September	455,000	349,000	0.712	384,000	....	....
October	349,000	288,000	0.578	312,000	....	....
November	308,000	269,000	0.516	279,000	....	....
December	269,000	233,000	0.467	252,000	....	....
The year	821,000	118,000	0.585	316,000	....	....

No. 1.—This column gives maximum daily flow, in gallons, for month.
No. 2.—This column gives minimum daily flow, in gallons, for month.
No. 3.—This column gives mean discharge, in second-feet, for month.
No. 4.—This column gives mean daily flow, in gallons, for month.

Daily Gauge Height and Discharge of Field Springs at Field (Weir No. 3) for 1915

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	0.0126	0.09	0.0061	0.10	0.0080	0.19	0.0398	0.18	0.0348	0.13	0.0154
2	0.12	0.0126	0.08	0.0046	0.12	0.0126	0.18	0.0348	0.17	0.0301	0.13	0.0154
3	0.12	0.0126	0.08	0.0046	0.10	0.0080	0.18	0.0348	0.18	0.0348	0.14	0.0186
4	0.12	0.0126	0.07	0.0033	0.09	0.0061	0.20	0.0453	0.17	0.0301	0.13	0.0154
5	0.11	0.0101	0.08	0.0046	0.08	0.0046	0.20	0.0453	0.17	0.0301	0.13	0.0154
6	0.10	0.0080	0.08	0.0046	0.08	0.0046	0.20	0.0453	0.16	0.0259	0.14	0.0186
7	0.11	0.0101	0.08	0.0046	0.09	0.0061	0.20	0.0453	0.16	0.0259	0.15	0.0221
8	0.11	0.0101	0.07	0.0033	0.10	0.0080	0.23	0.0642	0.16	0.0259	0.15	0.0221
9	0.10	0.0080	0.07	0.0033	0.10	0.0080	0.26	0.0872	0.16	0.0259	0.16	0.0259
10	0.09	0.0061	0.10	0.0080	0.09	0.0061	0.23	0.0642	0.16	0.0259	0.15	0.0221
11	0.09	0.0061	0.09	0.0061	....	0.0081	0.24	0.0714	0.16	0.0259	0.14	0.0186
12	0.09	0.0061	0.08	0.0046	0.11	0.0101	0.22	0.0575	0.16	0.0259	0.15	0.0221
13	0.10	0.0080	0.10	0.0080	0.13	0.0154	0.23	0.0642	0.16	0.0259	0.15	0.0221
14	0.10	0.0080	0.09	0.0061	0.12	0.0126	0.23	0.0642	0.16	0.0259	0.16	0.0259
15	0.09	0.0061	0.08	0.0046	0.12	0.0126	0.24	0.0714	0.16	0.0259	0.16	0.0259
16	0.09	0.0061	0.08	0.0046	0.13	0.0154	0.22	0.0575	0.16	0.0259	0.16	0.0259
17	0.08	0.0046	0.09	0.0061	0.14	0.0186	0.20	0.0453	0.17	0.0301	0.15	0.0221
18	0.08	0.0046	0.09	0.0061	0.12	0.0126	0.19	0.0398	0.17	0.0301	0.16	0.0259
19	0.08	0.0046	0.09	0.0061	0.15	0.0221	0.19	0.0398	0.17	0.0301	0.16	0.0259
20	0.09	0.0061	0.08	0.0046	0.16	0.0259	0.19	0.0398	0.17	0.0301	0.16	0.0259
21	0.08	0.0046	0.08	0.0046	0.15	0.0221	0.19	0.0398	0.17	0.0301	0.15	0.0221
22	0.08	0.0046	0.09	0.0061	0.14	0.0186	0.18	0.0348	0.16	0.0259	0.15	0.0221
23	0.08	0.0046	0.09	0.0061	0.12	0.0126	0.17	0.0301	0.16	0.0259	0.16	0.0259
24	0.09	0.0061	0.09	0.0061	0.11	0.0101	0.17	0.0301	0.15	0.0221	0.16	0.0259
25	0.09	0.0061	0.09	0.0061	0.16	0.0259	0.17	0.0301	0.15	0.0221	0.15	0.0221
26	0.09	0.0061	0.09	0.0061	0.24	0.0714	0.18	0.0348	0.15	0.0221	0.15	0.0221
27	0.09	0.0061	0.08	0.0046	0.22	0.0575	0.18	0.0348	0.14	0.0186	0.16	0.0259
28	0.09	0.0061	0.08	0.0046	0.20	0.0453	0.17	0.0301	0.14	0.0186	0.16	0.0259
29	0.10	0.0080	0.09	0.0061	0.18	0.0348	0.18	0.0348	0.15	0.0221	0.15	0.0221
30	0.11	0.0101	0.09	0.0061	0.17	0.0301	0.18	0.0348	0.15	0.0221	0.17	0.0301
31	....	....	0.09	0.0061	....	....	0.19	0.0398	0.14	0.0186	....	....

Day.	October.		November.		December.	
1	0.17	0.0301	0.17	0.0301	0.15	0.0221
2	0.17	0.0301	0.17	0.0301	0.15	0.0221
3	0.17	0.0301	0.16	0.0259	0.16	0.0259
4	0.17	0.0301	0.16	0.0259	0.17	0.0301
5	0.17	0.0301	0.16	0.0259	0.17	0.0301
6	0.16	0.0259	0.15	0.0221	0.17	0.0301
7	0.17	0.0301	0.14	0.0186	0.17	0.0301
8	0.17	0.0301	0.15	0.0221	0.17	0.0301
9	0.17	0.0301	0.14	0.0186	0.17	0.0301
10	0.17	0.0301	0.14	0.0186	0.17	0.0301
11	0.17	0.0301	0.13	0.0154	0.17	0.0301
12	0.17	0.0301	0.12	0.0126	0.17	0.0301
13	0.17	0.0301	0.12	0.0126	0.17	0.0301
14	0.17	0.0301	0.10	0.0101	....	0.0301
15	0.17	0.0301	0.10	0.0080	....	0.0301
16	0.17	0.0301	0.10	0.0080	0.17	0.0301
17	0.17	0.0301	0.10	0.0080	0.17	0.0301
18	0.17	0.0301	0.09	0.0061	0.17	0.0301
19	0.17	0.0301	0.09	0.0061	0.17	0.0301
20	0.17	0.0301	0.08	0.0046	0.17	0.0301
21	0.17	0.0301	0.09	0.0061	0.17	0.0301
22	0.17	0.0301	....	0.0074	0.16	0.0259
23	0.18	0.0348	....	0.0087	0.15	0.0221
24	0.17	0.0301	....	0.0100	0.15	0.0221
25	0.17	0.0301	....	0.0113	....	0.0221
26	0.17	0.0301	....	0.0127	....	0.0259
27	0.17	0.0301	....	0.0140	0.16	0.0259
28	0.18	0.0348	0.13	0.0154	0.16	0.0259
29	0.18	0.0348	0.13	0.0154	0.16	0.0259
30	0.17	0.0301	0.14	0.0186	0.16	0.0259
31	0.17	0.0301	....	....	0.17	0.0301

Monthly Discharge of Field Springs at Field (Weir No. 3) for 1915.

Month.	Discharge				Run-Off.	
	1 Maximum.	2 Minimum.	3 Mean.	4 Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	6,800	2,480	0.0075	4,050	....	....
May	4,320	1,780	0.0054	2,920	....	....
June	38,600	2,480	0.0185	9,990	....	....
July	47,100	16,300	0.0462	24,900	....	....
August	18,800	10,000	0.0262	14,100	....	....
September	16,200	8,320	0.0025	12,200	....	....
October	18,800	14,000	0.0304	16,400	....	....
November	16,300	2,480	0.0150	8,100	....	....
December	16,300	11,900	0.0279	15,100	....	....
The period	47,100	1,780	0.0199	11,970	....	....

No. 1.—This column gives maximum daily flow, in gallons, for month.
No. 2.—This column gives minimum daily flow, in gallons, for month.
No. 3.—This column gives mean discharge, in second-feet, for month.
No. 4.—This column gives mean daily flow, in gallons, for month.

FINDLAY CREEK.—(3036).

Location.—At highway bridge, on Findlay creek road, about 15 miles from the mouth, and 7 miles from Thunder hill.

Records Available.—1914 and 1915.

Drainage Area.—Not determined.

Climatic Conditions.—Summers hot and dry, winters severe with light snowfall. Frazil ice is to be expected.

Gauge.—A vertical staff, near Mason's cabin, about 1½ mile below measuring section. Daily readings were taken by Mr. O. Mason.

Channel.—Rocky above and below section, not likely to shift.

Discharge Measurements.—The 1915 data is based on one measurement made in 1913, five in 1914, and one in 1915.

Co-operation.—This station has been maintained by co-operation with the Provincial Water Rights Branch.

Accuracy.—"D." Accuracy should be within 20 per cent.

Discharge Measurements of Findlay Creek at Canal Flats (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Oct. 24	(Prov.) Bergoust	....	....	104	2.81	0.80	294
1914							
April 13	(Prov.) Bergoust	....	....	84.9	92.56	0.72	211
June 18	Elliott	1,909	59	375	10.50	6.20	3,940
Aug. 1	Elliott	1,909	49	184	5.77	2.70	1,060
Sept. 23	Gill	....	....	107	2.90	1.00	314
Oct. 20	Elliott	1,909	44	105	3.11	0.90	327
1915							
Sept. 25	(Prov.) Bergoust	1,927	54	89.3	3.17	0.90	282

Daily Gauge Height and Discharge of Findlay Creek at Canal Flats for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.2	....	2.2	810	2.2	810	3.2	1,370	2.9	1,180	1.6	540
2	0.2	....	1.9	660	2.8	1,120	3.2	1,370	2.9	1,180	1.5	500
3	0.6	270	1.8	620	2.4	910	3.2	1,370	2.8	1,120	1.5	500
4	0.5	252	1.6	540	2.6	1,010	3.5	1,570	2.8	1,120	1.5	500
5	0.4	238	1.6	540	3.0	1,240	3.6	1,640	2.6	1,010	1.6	540
6	0.4	238	1.6	540	2.7	1,060	3.5	1,570	2.0	710	1.5	500
7	0.4	238	2.0	710	3.4	1,510	3.4	1,510	2.0	710	1.3	430
8	0.4	238	2.6	1,010	3.1	1,300	3.3	1,440	2.8	1,120	1.0	348
9	0.4	238	2.8	1,120	2.7	1,060	2.8	1,120	2.6	1,010	1.0	348
10	0.3	....	2.9	1,180	2.5	960	2.8	1,120	2.6	1,010	1.0	348
11	0.3	....	2.5	960	2.2	810	2.3	860	2.6	1,010	0.9	325
12	0.4	238	2.0	710	2.0	710	2.0	710	2.0	710	0.8	306
13	0.9	325	2.0	710	2.4	910	2.1	760	2.0	710	0.8	306
14	0.9	325	2.2	810	2.4	910	2.5	960	2.0	710	0.7	280
15	0.9	325	2.1	760	2.9	1,180	2.4	910	2.0	710	0.7	288
16	1.1	372	1.9	660	3.2	1,370	2.3	860	2.0	710	0.8	306
17	1.6	540	1.7	580	3.2	1,370	2.3	860	2.0	710	0.8	306
18	1.8	620	1.7	580	2.9	1,180	2.4	910	2.0	710	0.8	306
19	1.9	660	1.7	580	2.6	1,010	2.7	1,060	2.0	710	1.0	348
20	1.9	660	1.6	540	2.4	910	2.8	1,120	2.1	760	0.8	306
21	1.7	580	1.9	660	2.4	910	2.8	1,120	2.0	710	0.8	306
22	1.4	460	2.2	810	2.6	1,010	2.7	1,060	1.8	620	0.7	288
23	1.2	400	2.2	810	3.0	1,240	2.5	960	2.0	710	0.7	288
24	1.2	400	2.2	810	3.2	1,370	2.4	910	2.1	760	1.0	348
25	1.1	372	2.2	810	3.6	1,640	2.6	1,010	2.1	760	0.9	325
26	1.1	372	2.1	760	3.3	1,440	2.6	1,010	1.9	660	0.9	325
27	1.2	400	2.0	710	2.8	1,120	2.8	1,120	1.9	660	1.2	400
28	1.1	372	2.4	910	2.6	1,010	2.8	1,120	1.9	660	1.0	348
29	1.4	460	2.8	1,120	2.6	1,010	2.8	1,120	2.0	710	0.9	325
30	1.7	580	2.4	910	2.8	1,120	3.0	1,240	1.8	620	0.8	306
31	....	....	2.2	820	....	....	2.6	1,010	1.9	660	....	....

	October.		November.		December.	
1	0.90	325	0.70	288	0.50	252
2	0.80	306	0.70	288	0.50	252
3	0.80	306	0.70	288	0.40	238
4	0.70	288	0.60	270	0.40	238
5	0.70	288	0.60	270	0.50	252
6	0.80	306	0.70	288	0.50	252
7	0.80	306	0.50	252	0.40	238
8	0.70	288	0.40	238	0.40	238
9	0.70	288	0.40	238	0.40	238
10	0.70	288	0.50	252	0.50	252
11	0.60	270	0.50	252	0.50	252
12	0.60	270	0.60	270	0.40	238
13	0.70	288	0.50	252	0.50	252
14	0.70	288	0.50	252	0.40	238
15	0.60	270	0.50	252	0.50	252
16	0.60	270	0.40	238	0.50	252
17	0.60	270	0.40	238	0.40	238
18	0.60	270	0.40	238	0.50	252
19	0.60	270	0.50	252	0.40	238
20	0.60	270	0.50	252	0.40	238
21	0.70	288	0.40	238	0.50	252
22	0.70	288	0.40	238	0.40	238
23	0.60	270	0.40	238	0.40	238
24	0.60	270	0.40	238	0.50	252
25	0.70	288	0.50	252	0.40	238
26	0.80	306	0.50	252	0.50	252
27	0.80	306	0.40	238	0.40	238
28	0.90	325	0.40	238	0.50	252
29	0.90	325	0.50	252	0.50	252
30	0.80	306	0.50	252	0.40	238
31	0.70	288	....	....	0.50	252

Monthly Discharge of Findlay Creek at Canal Flats for 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	1,180	540	766			47,100
June	1,640	710	1,110			66,000
July	1,640	710	1,120			68,900
August	1,180	620	811			49,900
September	540	288	363			21,600
October	325	270	290			17,800
November	288	238	253			15,100
December	252	238	245			15,100
The period	1,640	238	795			301,500

HOSPITAL CREEK.—(3053).

Location.—At dam above intake of old smelter flume, 1½ mile from Golden.

Records Available.—October and November, 1914, and all of 1915.

Drainage Area.—Eighteen square miles.

Climatic Conditions.—Similar to Golden. Summers are warm and dry, winters severe. Ice conditions generally exist from the middle of November till the end of March. Frazil ice is to be expected.

Weir.—A 10-foot Cippoletti weir.

Accuracy.—Readings at the gauge were only made once a week, so the accuracy cannot be expected to be closer than 20 per cent.

Co-operation.—The weir was established by Mr. O. J. Bergoust, of the Provincial Water Rights Branch. Mr. Bergoust kindly sent copies of readings, in 1914, and this year they have been sent direct by the reader, Mr. D. C. Robertson, of Golden.

Daily Gauge Height and Discharge of Hospital Creek at Golden for 1915.

(Drainage area, 18 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.15	1.88	....	1.31	....	1.19	0.19	2.74	0.92	29.80	....	32.00
2	....	1.88	....	1.31	....	1.22	0.19	2.74	0.81	24.70	....	31.70
3	....	1.88	....	1.31	....	1.25	0.19	2.74	0.81	24.70	0.95	31.50
4	....	1.88	....	1.31	....	1.28	0.19	2.74	0.75	21.90	....	31.30
5	....	1.88	0.11	1.31	0.11	1.31	0.19	2.74	0.76	22.30	....	31.10
6	....	1.88	....	1.27	....	1.31	0.19	2.74	1.01	34.90	....	30.90
7	....	1.88	....	1.23	....	1.31	0.19	2.74	1.23	48.60	....	30.80
8	0.15	1.88	....	1.19	....	1.31	0.19	2.74	1.12	41.80	....	30.70
9	....	1.82	....	1.16	....	1.31	0.19	2.74	1.02	35.50	....	30.60
10	....	1.76	0.10	1.13	....	1.31	0.19	2.74	1.04	36.80	....	30.50
11	....	1.70	....	1.13	....	1.31	0.21	3.20	0.98	33.20	0.93	30.40
12	....	1.64	....	1.13	0.11	1.31	0.23	3.69	0.88	27.60	....	30.60
13	....	1.59	....	1.13	....	1.31	0.25	4.20	0.83	25.60	0.94	30.90
14	....	1.54	....	1.13	....	1.31	0.25	4.20	0.80	24.20	1.00	34.40
15	0.12	1.49	....	1.13	....	1.31	0.29	5.30	0.79	23.70	1.10	40.50
16	....	1.46	....	1.13	....	1.31	0.33	6.47	....	25.00	1.08	39.20
17	....	1.43	....	1.13	....	1.31	0.42	9.06	....	26.40	1.25	50.00
18	....	1.40	0.10	1.13	....	1.31	0.67	18.30	....	27.80	1.17	44.50
19	....	1.37	....	1.13	0.11	1.31	0.69	19.20	....	29.20	1.16	43.50
20	....	1.35	....	1.13	....	1.36	0.58	15.00	....	30.60	1.14	42.50
21	....	1.33	....	1.13	....	1.41	0.58	15.00	0.96	32.00	1.06	38.10
22	0.11	1.31	....	1.13	....	1.46	0.56	14.20	....	32.10	1.06	38.10
23	....	1.31	....	1.13	....	1.51	0.55	13.80	....	32.20	1.07	38.40
24	....	1.31	....	1.13	....	1.56	0.58	15.00	....	32.30	1.08	39.20
25	....	1.31	....	1.13	....	1.62	0.69	18.30	....	32.40	1.14	42.50
26	....	1.31	0.10	1.13	0.13	1.68	0.71	20.10	....	32.60	1.28	51.90
27	....	1.31	....	1.15	....	1.85	0.73	21.00	....	32.80	1.50	68.10
28	....	1.31	....	1.17	....	2.02	0.73	21.00	0.98	33.20	1.58	74.50
29	0.11	1.31	....	....	....	2.19	0.83	25.60	....	32.90	1.54	71.30
30	....	1.31	....	....	....	2.37	0.94	30.90	....	32.60	1.46	64.90
31	....	1.31	....	....	....	2.56	....	....	....	32.30	....	....

	July.		August.		September.		October.		November.		December.	
1	1.23	48.60	0.78	23.20	0.31	5.87	....	5.23	....	5.30	....	3.86
2	1.12	41.80	0.76	22.30	0.30	5.58	....	5.26	....	4.74	....	3.82
3	1.08	39.30	0.73	21.00	0.29	5.30	0.29	5.30	0.27	4.74	....	3.78
4	1.02	35.50	0.72	20.50	0.29	5.30	....	5.22	....	4.74	....	3.75
5	0.98	33.20	0.71	20.10	0.29	5.30	....	5.14	0.27	4.74	....	3.72
6	0.96	32.00	0.69	19.20	0.29	5.30	....	5.06	0.26	4.47	0.23	3.69
7	0.93	30.40	0.62	16.60	0.29	5.30	....	4.98	....	4.20	....	3.65
8	0.86	27.10	0.58	15.00	0.29	5.30	....	4.90	....	4.13	....	3.61
9	0.84	26.10	0.56	14.20	0.29	5.30	....	4.82	....	4.06	....	3.57
10	0.80	24.20	0.51	12.30	0.29	5.30	0.27	4.74	....	3.99	....	3.53
11	0.79	23.70	0.49	11.30	0.29	5.30	....	4.68	....	3.93	....	3.50
12	0.83	25.60	0.47	10.80	0.31	5.87	....	4.62	....	3.87	....	3.47
13	1.16	44.90	0.46	10.40	0.30	5.58	....	4.57	....	3.81	0.22	3.44
14	....	51.90	0.45	10.10	0.30	5.58	....	4.52	....	3.75	....	3.37
15	....	58.90	0.43	9.39	0.30	5.58	....	4.47	0.23	3.69	....	3.30
16	....	66.90	0.42	9.06	0.30	5.58	....	4.47	....	3.76	....	3.23
17	....	74.90	0.40	8.39	0.29	5.30	0.26	4.47	....	3.83	....	3.16
18	1.69	82.90	0.44	9.74	0.29	5.30	....	4.50	....	3.90	....	3.09
19	1.59	75.40	0.43	9.39	0.29	5.30	....	4.54	....	3.97	....	3.03
20	1.44	63.40	0.40	8.39	0.29	5.30	....	4.58	....	4.04	0.20	2.97
21	1.29	52.90	0.36	7.40	0.29	5.30	....	4.62	....	4.12	....	2.90
22	1.02	35.50	0.34	6.79	0.29	5.30	....	4.66	0.25	4.20	....	2.83
23	0.95	31.50	0.33	6.47	0.28	5.02	....	4.70	....	4.16	....	2.76
24	0.94	30.90	0.33	6.47	0.28	5.02	0.27	4.74	....	4.12	....	2.69
25	0.92	29.80	0.33	6.47	....	5.05	....	4.92	....	4.08	....	2.62
26	0.88	28.20	0.33	6.47	....	5.08	....	5.11	....	4.04	....	2.56
27	0.85	28.60	0.34	6.79	....	5.11	0.29	5.30	....	4.00	0.18	2.50
28	0.86	27.10	0.33	6.47	....	5.14	0.29	5.30	....	3.97	....	2.50
29	0.84	26.10	0.33	6.47	....	5.17	....	5.30	0.24	3.94	....	2.50
30	0.81	24.70	0.33	6.47	....	5.20	....	5.30	....	3.90	....	2.50
31	0.80	24.20	0.32	6.17	....	....	0.29	5.30	....	....	....	2.50

Monthly Discharge of Hospital Creek near Golden for 1915.

(Drainage area, 18 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	1.88	1.31	1.55	0.09	0.10	95.3
February	1.31	1.13	1.17	0.06	0.06	65.0
March	2.56	1.19	1.49	0.08	0.09	91.6
April	30.90	2.74	10.40	0.58	0.65	619.0
May	48.60	21.90	30.70	1.71	1.97	1,890.0
June	74.50	30.40	40.80	2.27	2.53	2,430.0
July	82.90	23.70	40.10	2.23	2.57	2,470.0
August	23.20	6.17	11.40	0.63	0.73	701.0
September	5.87	5.02	5.33	0.29	0.32	317.0
October	5.30	4.47	4.88	0.27	0.31	300.0
November	5.30	3.69	4.14	0.23	0.26	246.0
December	3.86	2.50	3.17	0.18	0.21	195.0
The year	82.90	1.13	12.90	0.72	9.80	9,419.9

Note.—Readings at the gauge, generally speaking, were only made once a week,—therefore an accuracy closer than 20 per cent cannot be expected.

ILLECILLEWAET RIVER.—(3009).

Location.—This station is located about 1 mile from the mouth of the river and 1 mile from Revelstoke, at highway bridge.

Records Available.—1911-12-13-14-15.

Drainage Area.—Four hundred and eighty square miles.

Climatic Conditions.—At Revelstoke the precipitation from December 1, 1913, to November 30, 1914, was approximately 40.5 inches. The snowfall is approximately 10 feet, and the precipitation during the months December to March was 18 inches, practically all of which would be snow at higher altitudes. The winters are not severe, being seldom below 10 degrees Fahr. Frazil ice may be expected. The summer days are very hot, sometimes going as high as 100 degrees Fahr.

Gauge.—A chain gauge, referenced to two bench marks is used and read by Miss S. Moran, about 1 mile above the measuring section.

Channel.—The section at the gauge is very fast in high water, and at the measuring section there is a possibility of backwater from the Columbia during high flow. The control at the gauge appears permanent.

Discharge Measurements.—The 1915 data is based on a rating curve prepared from one measurement in 1913, ten in 1914, and four in 1915.

Accuracy.—"B" and "D." Daily readings were obtained, results should be within 10 per cent.

Discharge Measurements of Illecillewaet River at Revelstoke (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Nov. 22	Webb	1,048	130	431	1.41	2.35	607
1914							
Mar. 17	Webb	1,048	120	290	1.64	1.57	478
May 18	Elliott	1,672	122	704	5.21	4.80	3,670
June 9	Elliott	1,909	123	661	5.25	4.70	3,450
June 26	Elliott	1,909	137	820	6.33	5.70	5,190
July 25	Elliott	1,909	136	763	4.63	4.50	3,540
Aug. 11	Elliott	1,909	125	556	3.71	3.75	2,060
Sept. 5	Richardson	1,927	130	506	3.57	3.24	1,800
Oct. 9	Elliott	1,909	118	364	2.50	2.38	910
Oct. 26	Swan & Webb	1,909	147	325	2.49	1.95	809[1]
Nov. 17	Elliott	1,909	115	316	2.27	1.73	718
1915							
Mar. 17	Corbould	1,927	90	278	1.28	1.30	358
May 12	Dempster	1,929	130	630	5.00	4.30	3,150
Oct. 27	Richardson	1,929	123	407	3.55	2.96	1,440
Dec. 1	Richardson	1,929	115	198	2.19	1.40	433

[1] At gauging station.

Daily Gauge Height and Discharge of Illecillewaet River at Revelstoke for 1915.

(Drainage area, 480 square miles.)

Day.	March.		April.		May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	276	1.7	548	3.4	1,990	4.2	2,950	5.05	4,120	5.3	4,500
2	....	276	1.85	637	3.45	2,040	3.9	2,580	4.9	3,900	5.15	4,280
3	1.1	276	2.5	1,120	3.7	2,340	3.95	2,640	4.9	3,900	5.6	4,960
4	1.1	276	2.6	1,200	3.7	2,340	4.15	2,880	5.0	4,050	5.15	4,280
5	1.1	276	2.5	1,120	3.65	2,280	4.0	2,700	5.05	4,120	5.2	4,350
6	1.0	244	2.6	1,200	4.0	2,700	5.05	4,120	5.1	4,200	5.1	4,200
7	1.0	244	2.6	1,200	4.45	3,280	5.0	4,050	5.2	4,350	5.1	4,200
8	0.9	215	2.6	1,200	4.7	3,620	4.35	3,140	4.6	3,480	5.05	4,120
9	0.9	215	2.45	1,080	4.95	3,980	3.9	2,580	4.6	3,480	4.95	3,980
10	0.9	215	2.5	1,120	5.0	4,050	3.8	2,460	4.55	3,410	4.95	3,980
11	0.9	215	2.4	1,040	4.2	2,950	3.9	2,580	4.4	3,210	5.0	4,050
12	0.9	215	2.5	1,120	4.2	2,950	3.85	2,520	4.15	2,880	4.95	3,980
13	0.9	215	2.9	1,480	3.7	2,340	4.05	2,760	4.35	3,140	5.0	4,050
14	0.9	215	2.85	1,430	3.7	2,340	4.2	2,950	4.6	3,480	5.05	4,120
15	1.1	276	2.85	1,430	3.6	2,220	4.55	3,410	4.65	3,550	5.0	4,050
16	1.1	276	3.2	1,780	3.6	2,220	4.85	3,830	4.6	3,480	4.8	3,760
17	1.2	312	3.55	2,160	3.6	2,220	5.2	4,350	4.7	3,620	5.1	4,200
18	1.2	312	3.8	2,460	3.6	2,220	4.4	3,210	4.6	3,480	5.15	4,280
19	1.3	352	3.5	2,100	3.6	2,220	4.4	3,210	4.55	3,410	4.8	3,760
20	1.4	396	3.6	2,220	4.2	2,950	4.4	3,210	4.65	3,550	4.9	3,900
21	1.4	396	3.45	2,040	4.45	3,280	4.35	3,140	4.7	3,620	4.9	3,900
22	1.7	548	3.3	1,880	4.9	3,900	4.5	3,340	4.7	3,620	5.15	4,280
23	1.7	548	3.2	1,780	4.5	3,340	4.7	3,620	4.7	3,620	5.05	4,120
24	1.7	548	3.3	1,880	4.2	2,950	4.9	3,900	4.6	3,480	4.95	3,980
25	1.7	548	3.1	1,680	4.3	3,080	5.3	4,500	4.5	3,340	4.9	3,900
26	1.5	444	3.05	1,630	4.2	2,950	5.4	4,650	4.6	3,480	4.7	3,620
27	1.55	469	3.1	1,680	4.45	3,280	4.5	3,340	4.7	3,620	4.75	3,690
28	1.4	396	3.05	1,630	4.1	2,820	4.6	3,480	4.7	3,620	4.9	3,900
29	1.6	494	3.4	1,990	4.1	2,820	4.6	3,480	4.75	3,690	5.0	4,050
30	1.5	444	3.6	2,220	3.9	2,580	5.0	4,050	5.0	4,050	4.95	3,980
31	1.45	420	....	....	3.95	2,640	....	....	5.25	4,420	4.6	3,480

	September.		October.		November.		December.					
1	3.90	2,580	2.50	1,120	2.4	1,040	1.35	374	....	....	....	....
2	3.85	2,520	2.50	1,120	2.4	1,040	1.4	396	....	....	....	....
3	4.15	2,880	2.30	956	2.2	878	1.4	396	....	....	....	....
4	3.90	2,580	2.10	804	2.15	841	1.4	396	....	....	....	....
5	3.85	2,520	2.10	804	2.2	878	1.4	396	....	....	....	....
6	3.80	2,460	2.25	917	2.1	804	1.45	420	....	....	....	....
7	3.40	1,990	1.80	606	1.95	701	1.45	420	....	....	....	....
8	2.85	1,430	1.80	606	1.9	668	1.4	396	....	....	....	....
9	2.70	1,290	1.80	606	1.9	668	1.3	352	....	....	....	....
10	2.50	1,120	1.70	548	1.9	668	1.3	352	....	....	....	....
11	2.20	878	1.70	548	1.8	606	1.4	396	....	....	....	....
12	2.20	878	1.70	548	1.65	521	1.30	352	....	....	....	....
13	2.20	878	1.70	548	1.6	494	1.3	352	....	....	....	....
14	2.00	734	2.00	734	1.6	494	1.3	352	....	....	....	....
15	2.30	956	1.80	606	1.7	548	1.35	374	....	....	....	....
16	2.65	1,240	1.70	548	1.6	494	1.4	396	....	....	....	....
17	2.80	1,380	1.70	548	1.6	494	1.3	352	....	....	....	....
18	2.60	1,200	2.35	998	1.65	521	1.1	276	....	....	....	....
19	2.50	1,120	2.60	1,200	1.6	494	1.1	276	....	....	....	....
20	2.50	1,120	2.40	1,040	1.5	444	1.1	276	....	....	....	....
21	2.50	1,120	2.40	1,040	1.5	444	0.9	215	....	....	....	....
22	2.40	1,040	2.45	1,080	1.5	444	0.9	215	....	....	....	....
23	2.35	998	2.40	1,040	1.5	444	0.9	215	....	....	....	....
24	2.30	956	2.40	1,040	1.5	444	Frozen	....	....	....	....	....
25	2.30	956	2.40	1,040	1.4	396	....	....	....	....	....	....
26	2.30	956	2.70	1,290	1.3	352	....	....	....	....	....	....
27	2.30	956	2.95	1,530	1.3	352	....	....	....	....	....	....
28	2.20	878	2.90	1,480	1.3	352	....	....	....	....	....	....
29	2.15	841	1.80	1,380	1.3	352	....	....	....	....	....	....
30	2.30	956	2.50	1,120	1.3	352	....	....	....	....	....	....
31	....	....	2.40	1,040	....	....	....	....	....	....	....	....

Monthly Discharge of Illecillewaet River at Revelstoke for 1915.

(Drainage area, 480 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	548	215	340	0.71	0.82	20,900
April	2,460	548	1,540	3.20	3.57	91,600
May	3,980	1,990	2,800	5.83	6.72	172,000
June	4,650	2,460	3,320	6.92	7.72	198,000
July	4,420	2,880	3,660	7.62	8.78	225,000
August	4,960	3,480	4,060	8.46	9.75	250,000
September	2,880	734	1,380	2.87	3.20	82,100
October	1,530	548	919	1.91	2.20	56,500
November	1,040	352	574	1.19	1.33	34,200
The period	4,960	215	2,032	4.30	44.09	1,130,300

INCOMAPPLEUX RIVER.—(3030).

Location.—At the highway bridge, about 2 miles from Beaton.

Records Available.—1914 and 1915.

Drainage Area.—Four hundred and sixty square miles.

Climatic Conditions.—Similar to Revelstoke. The snowfall is heavy in the hills. Winters not severe. Summers hot. Frazil ice is to be expected.

Gauge.—A chain gauge about ½ mile above section is read daily by Mr. Jas. Burbridge.

Channel.—At the gauge the water is swift. The measuring section is satisfactory.

Discharge Measurements.—The 1915 data is compiled from a rating curve based on two measurements in 1913, six in 1914, and four in 1915.

Accuracy.—"B." The curve appears reliable. Results are considered within 10 per cent.

Discharge Measurements of Incomappleux River at Beaton (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft per sec	Feet	Sec.-ft
1913							
Sept. 18	Swan & Richardson	1,048	98	830	4.91	4.87	4,080
Nov. 21	Webb	1,048	93	526	1.13	2.40	597
1914							
May 21	Elliott	1,909	98	763	1.46	4.80	3,410
June 14	Beeston	1,927	97	973	5.41	6.10	5,360
June 27	Elliott	1,909	98	902	6.11	5.60	5,520
Sept. 4	Elliott	1,927	98	752	4.01	4.15	3,020
Oct. 27	Elliott	1,909	91	564	1.65	2.80	935
Nov. 20	Elliott	1,909	92	490	1.57	2.60	768
1915							
Mar. 19	Corbould	1,927	87	445	0.93	Ice	415
May 16	Dempster	1,929	96	620	3.49	3.90	2,160
Sept. 13	Dempster	1,927	97	554	1.66	2.85	920
Oct. 26	Dempster	1,927	98	555	2.24	3.30	1,240

Daily Gauge Height and Discharge of Incomappleux River at Beaton for 1915.

(Drainage area, 450 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.6	749	3.95	2,390	4.4	3,120	5.35	4,820	5.9	5,860	4.35	3,030
2	2.95	1,070	4.1	2,630	4.45	3,200	5.35	4,820	6.0	6,050	4.15	2,710
3	3.65	1,940	4.1	2,630	4.35	3,040	5.3	4,720	6.45	6,950	4.45	3,210
4	3.5	1,730	4.1	2,630	4.5	3,290	5.5	5,100	5.65	5,380	4.55	3,380
5	3.4	1,590	4.15	2,710	4.5	3,290	5.65	5,380	5.55	5,200	4.35	3,040
6	3.4	1,590	4.4	3,120	4.5	3,290	6.05	6,150	5.6	5,290	4.2	2,790
7	3.45	1,660	4.8	3,820	5.3	4,720	6.0	6,050	5.75	5,580	3.7	2,010
8	3.45	1,660	5.15	4,450	4.7	3,640	5.85	5,760	5.9	5,860	3.55	1,800
9	3.25	1,400	5.2	4,540	4.3	2,950	5.65	5,380	5.7	5,480	3.35	1,520
10	3.2	1,340	5.6	5,290	4.0	2,470	5.2	4,540	5.55	5,200	3.2	1,340
11	3.2	1,340	4.95	4,090	4.05	2,550	5.3	4,720	5.65	5,380	3.05	1,180
12	3.35	1,520	4.4	3,120	4.15	2,710	4.75	3,730	5.65	5,380	3.0	1,120
13	3.65	1,940	4.25	3,870	4.15	2,710	5.2	4,540	5.7	5,480	2.95	1,070
14	3.65	1,940	4.15	2,710	4.45	3,200	5.3	4,720	5.7	5,480	2.85	972
15	3.6	1,870	4.0	2,470	4.75	3,730	5.6	5,290	5.8	5,670	3.05	1,180
16	3.7	2,010	3.95	2,390	5.05	4,270	5.5	5,100	5.7	5,480	3.15	1,280
17	4.05	2,550	3.95	2,390	5.35	4,820	5.2	4,540	5.95	5,960	3.25	1,400
18	4.15	2,710	4.15	2,710	4.85	3,910	5.2	4,540	5.7	5,480	3.2	1,340
19	4.3	2,950	4.4	3,120	4.6	3,460	5.05	4,270	5.15	4,450	3.65	1,940
20	4.5	3,290	4.35	3,040	4.75	3,780	5.25	4,630	5.55	5,200	3.15	1,280
21	4.0	2,470	4.6	3,460	4.55	3,380	5.65	5,380	5.45	5,000	3.1	1,230
22	3.75	2,080	5.1	4,360	4.75	3,730	5.7	5,480	5.7	5,480	3.1	1,230
23	3.7	2,010	4.6	3,460	5.05	4,270	5.45	5,000	5.65	5,380	3.1	1,230
24	3.75	2,080	4.45	3,200	5.25	4,630	5.5	5,100	5.65	5,380	3.05	1,180
25	3.6	1,870	4.55	3,380	5.6	5,290	5.3	4,720	5.55	5,200	3.05	1,180
26	3.7	2,010	4.45	3,200	5.95	5,960	5.3	4,720	5.15	4,450	3.0	1,120
27	3.65	1,960	4.35	3,040	5.1	4,360	5.5	5,100	5.1	4,360	2.95	1,070
28	3.6	1,870	4.85	3,910	4.85	3,910	5.55	5,200	5.4	4,910	2.9	1,020
29	4.05	2,550	4.7	3,640	4.8	3,820	5.5	5,100	5.45	5,000	2.9	1,020
30	4.25	2,870	4.3	2,950	5.1	4,360	5.55	5,200	5.7	5,480	3.05	1,180
31	....	....	4.1	2,630	....	....	5.7	5,480	4.9	4,000	....	....

	October.		November.		December.	
1	3.30	1,460	3.30	1,460	2.30	527
2	3.15	1,280	3.20	1,340	2.30	527
3	2.95	1,070	3.15	1,280	2.30	527
4	2.90	1,020	3.10	1,230	2.30	527
5	2.95	1,070	3.15	1,280	2.30	527
6	2.80	925	3.00	1,120	2.30	527
7	2.70	834	3.00	1,120	2.30	527
8	2.65	792	2.90	1,020	2.30	527
9	2.60	749	2.80	925	2.40	596
10	2.50	670	2.75	880	2.30	527
11	2.50	670	2.70	834	2.30	527
12	2.60	749	2.60	749	2.30	527
13	2.60	749	2.45	633	2.20	463
14	2.80	925	2.50	670	2.20	463
15	2.60	749	2.60	749	2.20	463
16	2.55	710	2.60	749	2.20	463
17	2.65	792	2.60	749	2.20	463
18	3.05	1,180	2.50	670	2.20	463
19	3.20	1,340	2.50	670	2.20	463
20	3.00	1,120	2.50	670	2.20	463
21	3.10	1,230	2.50	670	2.15	434
22	3.15	1,280	2.50	670	2.10	404
23	3.05	1,180	2.40	596	2.15	434
24	3.15	1,280	2.40	596	2.10	404
25	3.10	1,230	2.40	596	2.00	350
26	3.35	1,520	2.40	596	2.00	350
27	3.60	1,870	2.40	596	2.00	350
28	3.85	2,240	2.40	596	Ice	340
29	3.55	1,800	2.40	596	....	330
30	3.45	1,660	2.40	596	....	320
31	3.40	1,590	....	....	....	310

Monthly Discharge of Incomappleux River at Beaton for 1915.

(Drainage area, 460 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	3,290	749	1,950	4.24	4.73	116,000
May	5,290	2.390	3,270	7.11	8.20	201,000
June	5,960	2,470	3,730	8.11	9.05	222,000
July	6,150	3,730	5,010	10.90	12.60	308,000
August	6,950	4,000	5,340	11.60	13.40	328,000
September	3,380	9,720	1,640	3.57	3.98	97,600
October	2,240	670	1,150	2.50	2.88	70,700
November	1,460	596	797	1.73	1.93	47,400
December	596	310	455	0.99	1.14	28,000
The period	6,950	310	2,594	5.64	57.91	1,418,700

KICKING HORSE RIVER.—(3011).

Location.—The station is located at traffic bridge, in Golden; section 12, township 27, range 22, west of 5th meridian.

Records Available.—Open season of 1912-13-14-15.

Drainage Area.—Seven hundred square miles.

Climatic Conditions.—Summers hot and quite dry. Winters severe. Snowfall is 3 to 4 feet. Frazil ice will be found at this point as well as practically up to its source.

Gauge.—A vertical staff gauge used, and read twice daily by Mr. W. Wenman, of Golden.

Channel.—Straight for 200 yards above and below section. The control is a sandbar about 200 yards downstream from section.

Discharge Measurements.—The 1915 rating curve was prepared from one metering in 1911, two in 1912, one in 1913, six in 1914, and six in 1915. A metering under ice conditions was made on February 22, 1912, and gave a discharge of 172 c.f.s. Another on February 28, 1914, gave a discharge of 276 c.f.s, A third on March 2, 1915, gave a discharge of 154 c.f.s.

Accuracy.—"B." Readings are reliable, measurements accurate, results should be within 10 per cent.

Discharge Measurements of Kicking Horse River at Golden (For Curve.)

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1911							
Oct. 18	Richardson.	1,048	103.0	279	1.66	1.72	464
1912							
Sept. 26	Richardson.	1,055	110.0	363	2.85	2.48	1,035
Oct. 1	Richardson	1,055	110.0	351	2.65	2.36	930
1913							
Nov. 29	Webb.....	1,048	96.0	277	1.40	1.55	384
1914							
Feb. 28	Webb..	1,048	126.0	284	0.98	Ice	278[1]
June 11	Elliott.	1,909	180.0	644	5.51	4.25	3,550
July 28	Elliott..	1,909	155.0	605	5.12	4.10	3,100
Aug. 6	Elliott...	1,909	155.0	692	5.94	4.50	1,110
Sept. 11	Richardson	1,927	98.0	391	3.30	2.90	1,290
Oct. 14	Elliott.....	1,909	81.0	329	2.77	2.32	912
1915							
Mar. 2	Corbould.	1,927	78.0	308	0.50	Ice	154[2]
May 15	Elliott..	1,672	98.0	434	3.92	3.20	1,700
May 18	Elliott..	1,672	98.0	423	3.78	3.05	1,600
July 5	Elliott..	1,909	157.0	739	6.97	4.95	5,160
July 14	Elliott...	1,909	176.0	765	6.95	5.00	5,320
Oct. 26	Richardson.	1,929	98.0	282	1.94	1.89	548

[1] Frazil ice.

[2] Ice conditions.

Daily Gauge Height and Discharge of Kicking Horse River at Golden for 1915.

(Drainage area, 700 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.25	266	3.4	2,030	3.56	2,270	5.2	5,840	5.0	5,330	3.9	2,840
2	1.28	276	3.38	2,000	3.74	2,560	5.03	5,410	4.9	5,080	3.92	2,880
3	1.58	396	3.3	1,890	3.6	2,330	4.8	4,830	5.0	5,330	3.85	2,750
4	1.63	422	3.25	1,820	3.71	2,510	4.76	4,730	5.06	5,490	3.92	2,880
5	1.56	387	3.24	1,810	3.84	2,730	4.9	5,080	4.84	4,930	3.7	2,490
6	1.55	382	3.34	1,940	3.82	2,700	4.95	5,200	4.65	4,460	3.7	2,490
7	1.6	405	3.7	2,490	3.84	2,730	4.98	5,280	4.7	4,580	3.5	2,180
8	1.61	410	4.08	3,190	3.9	2,840	4.98	5,280	4.85	4,960	3.25	1,820
9	1.55	382	4.25	3,540	3.66	2,430	4.88	5,030	4.61	4,360	3.05	1,580
10	1.5	360	4.35	3,750	3.51	2,200	4.78	4,780	4.51	4,110	2.82	1,330
11	1.54	378	4.26	3,530	3.34	1,950	4.32	3,680	4.69	4,560	2.68	1,190
12	1.58	396	3.88	2,800	3.35	1,960	4.22	3,470	4.79	4,800	2.6	1,120
13	1.7	460	3.68	2,460	3.45	2,100	4.25	3.540	4.64	4,430	2.51	1,050
14	1.71	466	3.54	2,240	3.51	2,200	5.1	5,590	4.5	4,090	2.42	972
15	1.72	472	3.35	1,960	3.7	2,490	5.2	5,840	4.8	4,780	2.4	955
16	1.93	606	3.18	1,740	4.06	3,150	5.27	6,020	4.36	3,770	2.4	955
17	2.2	800	3.08	1,620	4.48	4,040	5.45	6,480	4.65	4,460	2.4	955
18	2.42	972	3.1	1,640	4.4	3,860	5.46	6,510	4.72	4.630	2.4	955
19	2.72	1,230	3.11	1,650	4.25	3,540	5.2	5,840	4.5	4,090	2.4	955
20	2.95	1,480	3.13	1,680	4.31	3,660	5.05	5.460	4.55	4,210	2.4	955
21	2 85	1.360	3.28	1,860	4.28	3,600	4.96	5,230	4.59	4,310	2.45	998
22	2.83	1,360	3.65	2,410	4.28	3,600	5.15	5,720	4.56	4,230	2.45	998
23	2.55	1,080	3.61	2,350	4.51	4,110	5.08	5,530	4.45	3,980	2.38	939
24	2.58	1,100	3.6	2,330	4.55	4,210	4.78	4,780	4.59	4,310	2.4	955
25	2.55	1,080	3.68	2,460	5.0	5,330	4.51	4,110	4.52	4,140	2.4	955
26	2.5	1,040	3.73	2,540	5.95	7,840	4.45	3,980	4.42	3,910	2.38	939
27	2.48	1,020	3.55	2,260	5.6	6,890	4.5	4,090	4.35	3,750	2.3	875
28	2.4	955	3.66	2,430	5.3	6,090	4.65	4,460	4.28	3,600	2.24	830
29	2.55	1,080	3.8	2,660	5.17	5,760	4.71	4,600	4.38	3,820	2.2	800
30	2.99	1,520	3.62	2,360	5.25	5,960	4.71	4,600	4.28	3,600	2.18	785
31	....	....	3.5	2,180	....	....	4.84	4,930	4.3	3,640	....	....

	October.		November.		December.	
1	2.28	860	2.05	690	1.55	382
2	2.32	891	2.00	655	1.35	302
3	2.20	800	1.92	599	1.60	405
4	2.15	762	1.90	585	1.70	460
5	2.15	762	1.90	585	1.70	460
6	2.12	740	1.85	552	1.70	460
7	2.05	690	1.78	508	1.60	405
8	2.02	669	1.75	490	1.60	405
9	2.00	655	1.70	460	1.65	432
10	1.90	585	1.68	449	1.50	360
11	1.90	585	1.55	382	1.30	283
12	1.85	552	1.40	320	1.70	460
13	1.85	552	1.20	250	1.80	520
14	1.90	585	1.31	287	1.60	405
15	1.82	533	1.48	352	1.50	360
16	1.72	472	1.60	405	1.50	360
17	1.70	460	1.70	460	1.55	382
18	1.70	460	1.62	416	1.60	405
19	1.95	620	1.58	396	1.70	460
20	1.90	585	1.60	405	2.12	740
21	1.90	585	1.60	405	1.80	520
22	1.90	585	1.60	405	1.80	520
23	1.88	572	1.60	405	Ice	....
24	1.90	585	1.62	416	Ice	
25	1.90	585	1.60	405	Ice	
26	1.88	572	1.60	405	Ice	
27	2.06	697	1.65	382	Ice	
28	2.05	690	1.60	405	Ice	
29	2.09	718	1.60	405	Ice	
30	2.10	725	1.60	405	Ice	
31	2.05	690	....	....	Frozen	

Monthly Discharge of Kicking Horse River at Golden for 1915.

(Drainage area, 700 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,520	266	751	1.07	1.19	44,700
May	3,750	1,620	2,310	3.30	3.80	142,000
June	7,840	1,950	3,590	5.13	5.72	214,000
July	6,510	3,470	5,030	7.19	8.29	309,000
August	5,490	3,600	4,380	6.26	7.22	269,000
September	2,880	785	1,410	2.01	2.24	83,900
October	891	460	639	0.91	1.05	39,300
November	690	250	443	0.63	0.70	26,400
The period	7,840	250	2,319	3.31	30.21	1,128,300

KICKING HORSE RIVER.—(3012).

Location.—The station is in township 28, range 18, west of 5th meridian, below the mouth of Yoho river, on first traffic bridge, about 3¼ miles east of Field.

Records Available.—Open season, 1912-13-14-15.

Drainage Area.—One hundred and thirty square miles.

Climatic Conditions.—Summers are short, with some very hot days, and nights generally cool. The rainfall in summer months varies greatly, but is usually much less in July and August than in June. Winters are cold, with occasional severe storms. The river, near Field, is generally frozen for three or four months, and frazil ice is to be expected.

Gauge.—A chain gauge is read daily by Mr. Wm. Tarr, of Field.

Channel.—The channel is straight for 50 yards above and below station, the current is swift during freshet, the control is fairly permanent, but shifted slightly in 1915.

Discharge Measurements.—The 1915 rating curve was prepared from twenty-seven well-distributed measurements.

Accuracy.—"C" and "D." Gauge readings are reliable, and the measurements are accurate, and though a slight shift was noted, results are considered to be within 15 per cent.

Discharge Measurements of Kicking Horse River at Field (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
June 6	Richardson	1,048	58	120	2.46	4.40	295
June 25	Richardson	1,048	145	403	8.88	7.00	3,600
June 26	Richardson	1,048	145	488	9.65	7.60	4,710
July 2	Richardson	1,048	145	272	7.14	6.00	1,940
Aug. 13	Richardson	1,048	73	192	5.00	5.35	963
Oct. 2	Richardson	1,048	53	102	2.10	3.70	214
Nov. 19	Richardson	1,048	45	74	1.60	3.10	116
1913							
May 22	Richardson	1,048	60	126	2.40	4.15	300
July 3	Richardson	1,048	73	220	5.82	5.70	1,280
July 28	Richardson	1,048	88	300	7.40	6.30	2,220
July 30	Richardson	1,048	75	206	5.90	5.55	1,200
July 31	Richardson	1,048	89	281	7.70	6.20	2,190
Aug. 28	Swan & Richardson	1,048	88	297	7.80	6.30	2,300
Sept. 12	Richardson	1,048	61	155	3.20	4.80	496
Dec. 1	Richardson & Webb	1,048	45	55.2	1.55	2.95	86
1914							
June 14	Elliott	1,909	72	218	6.41	5.60	1,410
July 29	Elliott	1,909	75	227	6.49	5.50	1,470
Sept. 12	Elliott	1,927	60	137	2.84	4.30	390
Sept. 21	Richardson	1,927	55	116	2.35	4.10	272
Oct. 16	Elliott	1,909	52	103	1.93	3.65	199
1915							
Mar. 10	Corbould	1,927	39	45	0.90	Ice	40.7[1]
May 9	Elliott	1,672	62	168	4.57	4.80	769
May 17	Elliott	1,672	60	125	2.60	4.10	324
July 3	Elliott	1,909	75	207	6.39	5.30	1,320
July 14	Elliott	1,909	70	230	6.61	5.70	1,520
Oct. 20	Richardson	1,929	43	67.8	1.63	3.40	111
Nov. 27	Richardson	1,929	47	60.2	1.20	3.15	72.3

[1] Ice conditions.

Daily Gauge Height and Discharge of Kicking Horse River at Field for 1915.

(Drainage area, 130 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.75	45.0	....	286	4.45	506	5.75	1.620	6.15	2,060	6.50	2,470
2	2.85	50.0	3.95	266	4.45	506	5.70	1,570	6.25	2,170	6.75	2,800
3	3.00	60.0	3.95	266	4.35	449	5.65	1,520	6.60	2,600	6.95	3,060
4	3.00	60.0	4.05	305	4.50	535	5.65	1,520	6.85	2,920	6.85	2,920
5	....	64.5	4.15	349	4.80	744	5.70	1,570	6.95	3,060	6.60	2,600
6	3.10	69.0	4.25	397	4.75	707	5.90	1,790	7.15	3,340	6.55	2,540
7	....	64.5	4.35	449	4.90	821	6.15	2,060	7.25	3,500	6.15	2,060
8	3.00	60.0	4.80	744	4.75	707	6.10	2,000	7.25	3,500	5.40	1,270
9	2.90	53.0	5.15	1,030	4.65	635	6.15	2,060	7.25	3,500	5.10	988
10	2.80	47.0	5.10	988	4.55	568	6.20	2,110	7.05	3,200	4.90	821
11	....	53.5	4.75	707	4.50	535	6.05	1,940	7.00	3,130	4.50	535
12	3.00	60.0	4.55	568	4.45	506	5.90	1,790	6.75	2,800	4.40	476
13	....	67.5	4.45	506	4.65	635	5.65	1,520	6.65	2,660	4.35	449
14	3.15	75.0	4.50	535	4.75	707	5.35	1,220	6.45	2,410	4.30	422
15	....	89.5	4.35	449	4.90	821	5.45	1,320	6.80	2,860	4.25	397
16	3.35	104.0	4.40	476	5.05	945	5.50	1,370	6.85	2,920	4.20	372
17	3.50	132.0	4.35	449	5.25	1,120	5.35	1,220	6.95	3,060	4.15	349
18	3.65	168.0	4.25	397	5.55	1,420	5.60	1,470	7.10	3,270	4.10	326
19	3.	217.0	4.15	349	5.35	1,220	5.80	1,680	6.95	3,060	4.05	305
20	3.95	266.0	4.05	305	5.00	902	5.90	1,790	6.85	2,920	4.05	305
21	....	231.0	4.20	372	4.95	862	6.00	1,890	6.75	2,800	4.10	326
22	3.75	196.0	4.50	535	5.00	902	6.20	2,110	6.95	3,060	4.00	284
23	3.65	168.0	4.20	372	5.25	1,120	6.00	1,890	7.05	3,200	4.05	305
24	3.	162.0	4.10	326	5.35	1,220	5.50	1,370	6.75	2,800	4.05	305
25	3.60	155.0	4.15	349	5.65	1,520	5.50	1,370	6.90	2,990	4.10	326
26	....	149.0	4.25	397	6.10	2,000	5.70	1,570	6.95	3,060	4.05	305
27	3.55	144.0	4.50	535	5.70	1,570	6.05	1,940	6.85	2,920	4.05	305
28	3.55	144.0	4.55	568	5.65	1,520	6.40	2,350	6.85	2,920	4.00	284
29	3.65	168.0	4.65	635	5.60	1,470	6.60	2,600	6.55	2,540	3.95	266
30	4.05	305.0	4.55	568	5.55	1,420	6.50	2,470	6.45	2,410	3.95	266
31	....	....	4.50	535	....	....	6.50	2,470	6.20	2,110	....	....

	October.		November.		December.	
1	3.90	247	3.40	112.0	3.10	69.0
2	3.90	247	3.40	112.0	....	69.0
3	4.00	284	3.40	112 0	3.10	69.0
4	3.90	247	3.30	95.0	3.10	69.0
5	3.95	266	....	95.0	....	69.0
6	3.90	247	3.30	95.0	3.10	69.0
7	3.90	247	....	95.0	3.00	60.0
8	4.00	284	3.30	95.0	....	64.5
9	3.90	247	3.30	95.0	3.10	69.0
10	....	266	....	95.0	....	64.5
11	4.00	284	3.30	95.0	3.00	60.0
12	3.90	247	3.30	95.0	3.00	60.0
13	3.90	247	3.20	81.0	....	60.0
14	3.80	212	3.20	81.0	3.00	60.0
15	3.80	212	3.30	95.0	3.00	60.0
16	3.70	181	....	88.0	3.10	69.0
17	3.60	155	3.20	81.0	....	64.5
18	3.60	155	....	81.0	3.00	60.0
19	3.50	132	3.20	81.0	3.00	60.0
20	......	122	3 20	81.0	....	60.0
21	3.40	112	3.20	81.0	3.00	60.0
22	......	122	....	81.0	....	60.0
23	3.50	132	3.20	81.0	3.00	60.0
24	3.50	132	3.10	69.0	....	56.5
25	3.40	112	3.20	81.0	2.90	53.0
26	3 50	132	....	75.0	Ice	....
27	3.50	132	3.10	69.0	Ice	
28	......	132	....	75.0	Ice	
29	3.50	132	3.20	81.0	Ice	
30	3.40	112	3.10	69.0	Ice	
31	3.40	112	....	....	Ice	

Monthly Discharge of Kicking Horse River at Field for 1915.

(Drainage area, 130 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	305	45.0	121.0	0.93	1.04	7,200
May	1,030	266.0	484.0	3.72	4.29	29,700
June	2,000	449.0	953.0	7.33	8.18	56,700
July	2,600	1,220.0	1,780.0	13.70	15.80	109,000
August	3,500	2,060.0	2,900.0	22.30	25.70	178,000
September	3,060	266.0	948.0	7.29	8.13	56,400
October	284	112.0	190.0	1.46	1.68	11,700
November	112	69.0	87.4	0.67	0.75	5,200
The period	3,500	45.0	933.0	7.17	65.57	453,900

KICKING HORSE RIVER.—(3013).

Location.—Township 28, range 18, west of 5th meridian, above mouth of Yoho river, immediately above C.P.R. bridge over Kicking Horse, between tunnels Nos. 1 and 2, 5 miles east of Field.

Records Available.—July to October, 1912, April, 1913, to December, 1914, and all 1915.

Drainage Area.—Fifty square miles.

Climatic Conditions.—Similar to Field, with possibly a little more snow.

Gauge.—Vertical staff gauge read by Mr. C. E. Hamilton, and later by Mr. W. J. Hartley.

Channel.—Straight for 25 yards above and below section. Control is not permanent.

Discharge Measurements.—The 1915 rating curve is deduced from seven well-distributed measurements made during the year.

Accuracy.—"B" and "C." At high water the measuring section is not satisfactory. The control below the gauge is not permanent. The results are considered to be within 15 per cent.

Discharge Measurements of Kicking Horse River at No. 2 Tunnel for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
Mar. 10	Corbould	1,927	16.0	11.8	0.77	0.35	9.06[1]
May 9	Elliott	1,927	18.0	44.1	4.53	2.10	200.0
May 17	Elliott	1,927	31.0	30.7	2.78	1.40	85.5
July 3	Elliott	1,909	21.0	72.8	5.83	3.70	424.0
July 14	Elliott	1,909	20.0	66.8	5.84	3.80	390.0
Oct. 20	Richardson	1,929	12.5	12.2	3.48	0.80	42.1
Nov. 27	Richardson	1,929	10.4	9.27	2.40	0.48	22.2

[1] Ice conditions.

Daily Gauge Height and Discharge of Kicking Horse River at No. 2 Tunnel for 1915.

(Drainage area, 50 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.22	12.6	0.22	12.6	0.1	8.8	0.22	12.6	1.53	100.0	2.0	139
2	0.22	12.6	0.22	12.6	0.1	8.8	0.28	14.4	1.5	88.4	2.12	152
3	0.22	12.6	0.22	12.6	0.1	8.8	0.35	17.4	1.43	82.5	2.12	152
4	0.22	12.6	0.22	12.6	0.1	8.8	0.35	17.4	1.4	80.0	2.0	139
5	0.22	12.6	0.22	12.6	0.1	8.8	0.35	17.4	1.4	80.0	2.08	148
6	0.22	12.6	0.22	12.6	0.1	8.8	0.35	17.4	1.4	80.0	2.0	139
7	0.22	12.6	0.22	12.6	0.1	8.8	0.42	20.3	1.63	100.0	2.08	148
8	0.22	12.6	0.22	12.6	0.1	8.8	0.48	22.8	2.1	150.0	2.28	172
9	0.22	12.6	0.22	12.6	0.1	8.8	0.48	22.8	2.48	198.0	2.12	152
10	0.22	12.6	0.22	12.6	0.1	8.8	0.48	22.8	2.6	214.0	1.88	126
11	0.22	12.6	0.10	8.8	0.1	8.8	0.35	17.4	2.35	182.0	1.8	117
12	0.22	12.6	0.10	8.8	0.1	8.8	0.35	17.4	2.1	150.0	1.75	112
13	0.22	12.6	0.10	8.8	0.1	8.8	0.48	22.8	1.9	128.0	1.9	128
14	0.22	12.6	0.10	8.8	0.1	8.8	0.48	22.8	1.82	119.0	2.0	139
15	0.22	12.6	0.10	8.8	0.1	8.8	0.6	28.4	1.63	100.0	2.35	182
16	0.22	12.6	0.10	8.8	0.1	8.8	0.6	28.4	1.5	88.4	2.72	231
17	0.22	12.6	0.10	8.8	0.1	8.8	0.73	35.3	1.43	82.5	3.5	360
18	0.22	12.6	0.10	8.8	0.1	8.8	0.8	39.2	1.4	80.0	3.28	322
19	0.22	12.6	0.10	8.8	0.1	8.8	1.0	51.3	1.4	80.0	3.05	283
20	0.22	12.6	0.10	8.8	0.1	8.8	1.1	57.8	1.4	80.0	3.02	278
21	0.22	12.6	0.10	8.8	0.1	8.8	1.1	57.8	1.55	92.9	3.02	278
22	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	1.95	134.0	3.15	300
23	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	1.9	128.0	3.35	334
24	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	1.98	137.0	3.52	364
25	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	2.0	139.0	4.22	504
26	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	2.0	139.0	5.75	832
27	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	1.85	122.0	4.75	614
28	0.22	12.6	0.10	8.8	0.22	12.6	1.0	51.3	1.88	126.0	4.38	536
29	0.22	12.6	....	....	0.22	12.6	1.0	51.3	1.9	128.0	4.12	484
30	0.22	12.6	....	....	0.22	12.6	1.37	77.6	1.95	134.0	4.15	490
31	0.22	12.6	....	....	0.22	12.6	....	....	1.85	122.0	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	4.12	484	3.62	383	2.9	259	1.15	61.2	0.75	36.4	0.4	19.4
2	3.78	415	3.52	364	2.58	211	1.1	57.8	0.7	33.6	0.4	19.4
3	3.75	409	3.75	409	2.45	194	1.15	61.2	0.7	33.6	0.4	19.4
4	3.75	409	3.58	375	2.4	188	1.05	52.6	0.7	33.6	0.4	19.4
5	3.75	409	3.52	364	2.35	182	1.1	57.8	0.7	33.6	0.4	19.4
6	3.95	449	3.42	346	2.1	150	1.1	57.8	0.65	31.0	0.4	19.4
7	4.18	496	3.3	325	1.55	92.9	1.0	51.3	0.6	28.4	0.4	19.4
8	4.15	490	3.35	334	1.88	126	1.0	51.3	0.6	28.4	0.4	19.4
9	4.05	470	3.32	328	1.72	109	1.0	51.3	0.6	28.4	0.4	19.4
10	3.7	399	3.3	325	1.58	95.6	1.0	51.3	0.55	26.0	0.4	19.4
11	3.2	308	3.28	322	1.45	84.2	0.95	48.2	0.55	26.0	0.4	19.4
12	2.85	251	3.25	316	1.38	78.4	0.9	45.0	0.5	23.7	0.4	19.4
13	2.85	251	3.2	308	1.3	72.0	0.85	42.1	0.5	23.7	0.4	19.4
14	3.32	328	3.2	308	1.25	68.3	0.85	42.1	0.55	26.0	0.4	19.4
15	3.75	409	3.28	322	1.2	64.5	0.8	39.2	0.55	26.0	0.4	19.4
16	3.95	449	3.3	325	1.2	64.5	0.75	36.4	0.55	26.0	0.4	19.4
17	4.18	496	3.35	334	1.1	57.8	0.75	36.4	0.5	23.7	0.4	19.4
18	4.15	490	3.3	342	1.1	57.8	0.75	36.4	0.5	23.7	0.4	19.4
19	4.02	463	3.2	308	1.1	57.8	0.75	36.4	0.5	23.7	0.45	21.6
20	4.1	480	3.3	325	1.1	57.8	0.8	39.2	0.5	23.7	0.45	21.6
21	4.1	480	3.32	328	1.1	57.8	0.8	39.2	0.5	23.7	0.50	23.7
22	4.12	484	3.15	300	1.1	57.8	0.8	39.2	0.5	23.7	0.50	23.7
23	4.15	490	3.1	291	1.1	57.8	0.75	36.4	0.5	23.7	0.50	23.7
24	3.75	409	3.18	305	1.1	57.8	0.75	36.4	0.5	23.7	0.45	21.6
25	3 5	360	3.1	291	1.1	57.8	0.75	36.4	0.45	21.6	0.45	21.6
26	3.35	334	3.1	291	1.1	57.8	0.75	36.4	0.45	21.6	Ice	19.4
27	3.32	328	3.05	283	1.1	57.8	0.75	36.4	0.45	21.6	Ice	19.4
28	3.52	364	3.0	275	1.1	57.8	0.75	36.4	0.4	19.4	Ice	19.4
29	3.65	389	2.92	262	1.1	57.8	0.75	36.4	0.4	19.4	Ice	19.4
30	3.65	389	3.0	275	1.0	51.3	0.8	39.2	0.4	19.4	Ice	19.4
31	3.72	403	3.1	291	....	....	0.8	39.2	....	....	Ice	19.4

Monthly Discharge of Kicking Horse River at No. 2 Tunnel for 1915.

(Drainage area, 50 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
January	12.6	12.6	12.6	0.25	0.29	775
February	12.6	8.8	10.2	0.21	0.22	570
March	12.6	8.8	10.0	0.20	0.23	615
April	77.6	12.6	35.0	0.70	0.78	2,080
May	214.0	80.0	118.0	2.36	2.72	7,260
June	832.0	112.0	278.0	5.56	6.20	16,500
July	496.0	251.0	412.0	8.28	9.55	25,300
August	409.0	262.0	321.0	6.42	7.40	19,700
September	259.0	51.3	94.7	1.89	2.11	5,640
October	61.2	36.4	44.1	0.88	1.02	2,710
November	36.4	19.4	25.9	0.52	0.58	1,540
December	23.7	19.4	20.1	0.40	0.46	1,240
The year	832.0	8.8	115.1	2.30	31.56	83,930

NO. 2 CREEK.—(3015).

Location.—The section is located about 2 miles from the mouth of the creek, at highway bridge, on road from Wilmer to Forster's landing.

Records Available.—June to October, 1912, May to October, 1913, April to November, 1914, and April to October, 1915.

Drainage Area.—One hundred and twenty square miles.

Climatic Conditions.—Precipitation is light, the summers are hot and dry, winters severe.

Gauge.—A staff gauge is used and is read by Mr. F. B. Hume.

Channel.—The section is in the middle of a straight stretch of 100 feet, the bed is rocky, gravelly and sandy, and may shift a little.

Discharge Measurements.—The 1915 rating curve is based on one measurement in 1914 and five in 1915.

Accuracy.—"B," "C" and "D." Meterings are reliable, but as readings are taken only three times a week, results vary from 10 to 20 per cent.

Discharge Measurements of No. 2 Creek at Forster's (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet	Sec.-ft.
1914							
Oct. 22	Elliott	1,909	33	79.2	2.07	1.00	164.0
1915							
Feb. 26	Corbould	1,927	27	64.5	1.18	0.82	76.4
May 1	Elliott	1,672	33	90.6	3.35	1.45	305.0
May 23	Elliott	1,672	33	104.0	3.78	1.65	395.0
July 8	Elliott	1,909	33	136.0	7.25	2.40	987.0
Oct. 23	Richardson	1,929	33	76.5	1.97	0.98	151.0

Daily Gauge Height and Discharge of No. 2 Creek at Forster's for 1915.

(Drainage area, 120 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.6	88.0	1.0	157	....	402	....	742	2.7	1,330	....	742
2	....	85.0	....	185	1.7	428	2.2	785	....	1,390	2.1	700
3	....	82.0	1.2	213	....	377	....	832	2.8	1,450	....	660
4	0.5	79.0	....	270	1.5	327	2.3	880	....	1,450	2.0	620
5	....	82.0	1.5	327	....	406	....	985	2.8	1,450	....	660
6	....	85.0	....	406	1.8	486	2.5	1,090	....	1,510	2.1	700
7	0.6	88.0	1.8	486	....	553	....	1,150	2.9	1,580	....	660
8	....	88.0	....	518	2.0	620	2.6	1,210	....	1,510	2.0	620
9	0.6	88.0	1.9	550	....	553	....	1,060	2.8	1,450	....	585
10	....	83.5	....	489	1.8	486	....	910	....	1,390	1.9	550
11	0.5	79.0	1.7	428	....	430	....	760	2.7	1,330	....	550
12	....	89.5	....	377	1.6	375	2.0	620	....	1,330	1.9	550
13	0.7	100.0	1.5	327	....	351	....	620	2.7	1,330	....	585
14	....	108.0	....	287	1.5	327	2.0	620	....	1,270	2.0	620
15	0.8	116.0	1.3	247	....	351	....	585	2.6	1,210	....	585
16	....	116.0	....	247	1.6	375	1.9	550	....	1,210	1.9	550
17	0.8	116.0	1.3	247	....	402	....	518	2.6	1,210	....	550
18	....	116.0	....	230	1.7	428	1.8	486	....	1,090	1.9	550
19	0.8	116.0	1.2	213	....	457	....	518	2.4	980	....	518
20	....	125.0	....	249	1.8	486	1.9	550	....	930	1.8	486
21	0.9	135.0	1.4	285	....	518	....	625	2.3	880	....	457
22	....	135.0	....	356	1.9	550	2.1	700	....	880	1.7	428
23	0.9	135.0	1.7	428	....	585	....	840	2.3	880	....	356
24	....	146.0	....	457	2.0	620	2.4	980	....	880	1.4	285
25	1.0	157.0	1.8	486	....	620	....	1,030	2.3	880	....	266
26	....	157.0	....	518	2.0	620	2.5	1,090	....	930	1.3	247
27	1.0	157.0	1.9	550	....	660	....	1,090	2.4	980	....	230
28	....	157.0	....	489	2.1	700	2.5	1,090	....	930	1.2	213
29	1.1	183.0	1.7	428	....	700	....	1,150	2.3	880	....	213
30	1.0	157.0	....	402	2.1	700	2.6	1,210	....	832	1.2	213
31	....	....	1.6	375	....	....	....	1,270	2.2	785	....	....

Day.	October.	
1	....	205
2	....	198
3	....	190
4	1.10	183
5	....	183
6	1.10	183
7	....	198
8	1.20	213
9	....	213
10	1.20	213
11	....	198
12	1.10	183
13	....	170
14	1.00	157
15	....	157
16	1.00	157
17	....	157
18	1.00	157
19	....	157
20	1.00	157
21	....	170
22	1.10	183
23	....	170
24	1.00	157
25	1.00	146
26	0.90	135
27	....	146
28	1.00	157
29	....	157
30	1.00	157
31	....	157

Monthly Discharge of No. 2 Creek at Forster's Landing for 1915.

(Drainage area, 120 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	183	79	115	0.96	1.07	6,480
May	550	157	362	3.01	3.47	22,300
June	700	327	496	4.13	4.61	29,500
July	1,270	486	856	7.13	8.22	52,600
August	1,580	785	1,170	9.75	11.24	71,900
September	742	213	498	4.15	4.63	29,600
October	213	135	173	1.44	1.61	10,300
The period	1,580	79	524	4.36	34.85	222,680

SPILLIMACHEEN RIVER.—(3019).

Location.—The station is located at highway bridge, near mouth of river, about 4 miles from Spillimacheen landing.

Records Available.—June to October, 1912, June to November, 1913, April to December, 1914, and April to December, 1915.

Drainage Area.—Five hundred and eighty square miles.

Climatic Conditions.—The summer generally has hot days with cool nights, light precipitation. The winter is of about 4½ months duration, with considerable snowfall and low temperatures. The river usually freezes up in November or December, opening up again in April.

Gauge.—Vertical staff read two or three times weekly by Mr. Jas. Montgomery.

Channel.—The channel is straight above and below section for 50 yards, the control is a gravel bar, and there is a pronounced riffle at low water, 25 yards below the section.

Discharge Measurements.—The data for 1915 has been prepared from a rating curve based on nineteen measurements, well distributed, during the years 1912-13-14-15.

Accuracy.—"B" and "C." As readings are not taken daily, and there is a possibility of backwater in extreme high water, results cannot be considered closer than 10 or 15 per cent.

Discharge Measurements of Spillimacheen River at Spillimacheen Landing (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
May 31	Hughes	1,055	119	464	2.43	1.30	1,120
June 17	Hughes	1,055	122	585	4.70	2.20	2,740
June 19	Hughes	1,055	124	620	5.52	2.55	3,450
July 6	Hughes	1,055	122	568	4.18	2.25	2,750
July 19	Hughes	1,055	124	599	5.08	2.35	3,040
Sept. 29	Richardson	1,055	114	381	1.45	0.42	554
1913							
May 20	Elliott	1,672	117	466	2.60	1.17	1,210
June 25	Elliott	1,672	123	608	7.39	2.75	4,420
July 11	Richardson	1,048	123	570	6.60	2.60	3,880
July 27	Elliott	1,672	124	613	6.60	2.57	4,070
July 30	Elliott	1,672	122	571	4.70	2.10	2,710
Sept. 3	Swan & Richardson	1,048	118	490	3.12	1.50	1,530
Sept. 14	Elliott	1,672	119	488	3.58	1.57	1,750
Nov. 26	Webb	1,048	114	330	1.14	0.25	378
1914							
July 31	Elliott	1,909	124	585	5.84	2.45	3,430
Oct. 23	Elliott	1,909	114	374	1.28	0.40	480
1915							
May 3	Elliott	1,672	105	524	3.80	1.85	1,990
May 21	Elliott	1,672	105	530	3.65	1.80	1,920
Oct. 22	Richardson	1,929	114	425	1.19	0.40	507

Daily Gauge Height and Discharge of Spillimacheen River at Galena for 1915.

(Drainage area, 580 square miles.)

Day.	March.		April.		May.		June.		July.		August.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	....	348	1.8	1,950	....	2,110	....	2,980	2.7	3,870
2	....	....	....	396	1.9	2,100	1.85	2,020	....	3,040	....	4,060
3	....	....	0.3	445	....	1,960	....	2,050	2.4	3,100	....	4,250
4	....	....	0.3	445	....	1,810	....	2,080	2.5	3,340	2.9	4,440
5	....	....	....	437	1.6	1,670	1.9	2,100	....	3,710	....	4,160
6	....	....	....	429	....	2,000	2.0	2,270	....	4,070	....	3,880
7	....	....	0.25	420	....	2,320	....	2,210	2.9	4,400	2.6	3,600
8	....	....	....	429	2.2	2,650	....	2,160	....	3,960	2.6	3,600
9	....	....	....	437	2.5	3,340	1.9	2,100	....	3,470	....	3,600
10	....	....	0.3	445	....	2,980	....	2,050	2.35	2,980	....	3,600
11	....	....	0.35	420	....	2,630	....	2,000	2.3	2,870	....	3,600
12	....	....	....	429	2.0	2,270	1.8	1,950	....	2,950	2.6	3,600
13	....	....	....	437	....	2,160	....	1,880	....	3,020	....	3,470
14	....	....	0.3	445	....	2,060	1.7	1,810	2.4	3,100	2.5	3,340
15	....	....	....	587	1.8	1,950	....	2,340	....	3,020	2.45	3,220
16	0.1	345	....	728	1.65	1,740	2.3	2,870	....	2,950	....	3,280
17	0.1	345	0.9	870	....	1,720	....	2,730	2.3	2,870	2.5	3,340
18	....	345	1.2	1,170	....	1,690	....	2,590	2.6	3,600	....	3,220
19	0.1	345	....	1,230	1.6	1,670	2.1	2,450	....	3,690	....	3,100
20	0.1	345	....	1,280	....	1,870	1.95	2,180	....	3,780	....	2,990
21	0.0	300	1.35	1,340	....	2,070	....	2,410	2.7	3,870	2.3	2,870
22	....	323	....	1,230	2.0	2,270	....	2,640	....	3,690	2.4	3,100
23	....	346	....	1,120	2.0	2,270	2.3	2,870	....	3,520	....	3,020
24	0.15	370	1.05	1,010	....	2,240	....	3,200	2.5	3,340	....	2,950
25	....	354	1.05	1,010	....	2,210	....	3,540	2.5	3,340	2.3	2,870
26	....	338	....	1,010	1.95	2,180	2.7	3,870	....	3,260	....	2,870
27	0.05	322	....	1,020	....	2,210	2.4	3,100	....	3,180	....	2,870
28	0.05	322	1.06	1,020	....	2,240	....	2,980	2.4	3,100	2.3	2,870
29	....	315	....	1,330	2.0	2,270	2.3	2,870	....	3,270	2.35	2,980
30	....	308	....	1,640	2.0	2,270	....	2,930	....	3,430	....	2,710
31	0.0	300	....	....	....	2,190	....	....	2.6	3,600	....	2,440

	September.		October.		November.		December.	
1	2.00	2,270	....	675	....	520	0.10	345
2	....	2,330	0.70	700	.....	510	....	330
3	....	2,390	0.70	700	0.40	500	....	315
4	2.10	2,450	....	630	....	480	0.00	300
5	2.00	2,270	....	560	....	460	0.10	345
6	....	1,900	0.40	500	0.30	445	....	330
7	....	1,530	....	480	0.20	395	....	320
8	1.20	1,170	....	460	....	360	....	310
9	....	1,130	0.30	445	....	330	0.00	300
10	....	1,090	0.25	420	0.00	300	....	300
11	1.10	1,060	....	420	....	315	0.00	300
12	0.80	780	....	420	....	330	0.00	300
13	....	730	....	420	0.10	345	....	300
14	....	680	0.25	420	0.40	500	....	300
15	0.60	630	....	405	....	540	0.00	300
16	....	606	0.20	395	....	580	....	315
17	....	583	0.15	370	0.60	630	....	330
18	0.50	560	....	410	....	520	0.10	345
19	1.40	1,400	....	450	....	410	0.10	345
20	....	1,180	0.40	500	0.00	300	....	345
21	....	980	....	465	0.10	345	....	345
22	0.80	780	....	430	....	345	0.10	345
23	0.60	630	0.20	395	....	345	....	330
24	....	630	0.30	445	....	315	....	315
25	0.60	630	....	530	0.10	345	0.00	300
26	0.65	665	....	615	....	322	....	310
27	....	650	0.70	700	0.00	300	....	320
28	....	640	....	630	0.00	300	....	330
29	0.60	630	....	560	....	315	0.10	345
30	....	630	0.40	500	....	330	....	300
31	....	....	0.45	530			....	300

Monthly Discharge of Spillimacheen River at Galena for 1915.

(Drainage area, 580 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	1,640	348	785	1.35	1.51	46,700
May	3,340	1,670	2,160	3.72	4.29	133,000
June	3,870	1,810	2,480	4.28	4.77	148,000
July	4,440	2,870	3,370	5.81	6.70	207,000
August	4,440	2,440	3,350	5.78	6.66	206,000
September	2,450	560	1,120	1.93	2.15	66,600
October	700	370	503	0.87	1.00	30,900
November	630	300	402	0.70	0.78	23,900
December	345	300	320	0.55	0.63	19,700
The period	4,440	300	1,610	2.78	28.49	881,800

TOBY CREEK.—(3020).

Location.—The section is located at highway bridge, on road from Athalmer to Wilmer, 1½ miles from Athalmer and 1 mile from mouth of creek.

Records Available.—June to September, 1912, May to October, 1913, April to November, 1914, and April to November, 1915.

Drainage Area.—One hundred and eighty square miles.

Climatic Conditions.—Precipitation is light. Summer days are hot and the evenings cool. Duration of winter is about four months, and severe at times. Chinook winds occasionally strike the locality, and changes in temperature result. Toby creek remains frozen about four months of the year.

Gauge.—A vertical staff read by Mr. H. H. Peters of Wilmer.

Channel.—The channel is straight above the section and widens out below. Two channels are formed by a central pier in the bridge. The water does not flow at right angles to the bridge, and runs swiftly.

Discharge Measurements.—The 1915 data is prepared from a rating curve based on three measurements in 1914, and six in 1915, all of them well distributed.

Accuracy.—"C." Results considered to be within 15 per cent.

Discharge Measurements of Toby Creek at Athalmer (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 5	Gill	1,048	160	316	2.00	2.20	631
June 19	Elliott	1,909	198	627	4.79	2.65	3,000
Oct. 22	Elliott	1,909	185	159	1.87	1.60	298
1915							
Feb. 26	Elliott & Corbould	1,927	22	55.2	1.25	Ice	69.2[1]
May 1	Elliott	1,672	190	217	2.57	1.28	558[2]
May 23	Elliott	1,672	189	285	2.87	1.35	817
July 8	Elliott	1,909	191	326	3.86	2.00	1,260
Sept. 24	(Prov.) Bergoust	....	137	153	2.24	0.60	342
Oct. 23	Richardson	1,929	64	132	1.89	0.45	250

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[1] Ice conditions.

[2] New gauge.

Daily Gauge Height and Discharge of Toby Creek at Athalmer for 1915.

(Drainage area, 180 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	1.30	678	1.50	821	2.30	1,830	2.65	2,720	1.50	821
2	....	....	1.20	612	1.50	821	2.20	1,640	2.70	2,880	1.60	900
3	....	....	1.10	550	1.50	821	2.30	1,830	2.55	2,430	1.80	1,090
4	....	....	1.00	494	1.50	821	2.30	1,830	2.50	2,290	1.80	1,090
5	....	....	1.00	494	1.65	945	2.40	2,050	2.50	2,290	1.80	1,090
6	....	....	1.10	550	1.65	945	2.50	2,290	2.50	2,290	1.40	748
7	0.30	214	1.30	678	1.80	1,090	2.30	1,830	2.20	1,640	1.20	612
8	0.30	214	1.60	900	1.70	990	2.20	1,640	2.50	2,290	1.10	550
9	0.30	214	1.70	990	1.60	900	2.20	1,640	2.40	2,050	1.00	494
10	0.30	214	1.65	945	1.45	784	2.10	1,480	2.40	2,050	0.80	398
11	0.30	214	1.40	748	1.45	784	1.80	1,090	2.10	1,480	0.75	376
12	0.35	229	1.30	678	1.45	784	1.65	945	2.60	2,570	0.70	355
13	0.35	229	1.20	612	1.50	821	2.10	1,480	2.40	2,050	0.65	335
14	0.40	244	1.20	612	1.55	861	1.80	1,090	2.00	1,340	0.60	315
15	0.45	261	1.20	612	1.75	1,040	1.80	1,090	2.40	2,050	0.60	315
16	0.60	315	1.10	550	1.80	1,210	1.70	990	2.50	2,290	0.60	315
17	0.80	398	1.05	522	2.00	1,340	1.65	945	2.50	2,290	0.60	315
18	0.90	444	1.00	494	1.90	1,210	2.00	1,340	2.45	2,170	0.60	315
19	0.95	469	1.00	494	1.70	990	2.00	1,340	2.10	1,480	0.60	315
20	1.00	494	1.00	494	1.50	821	2.10	1,480	2.20	1,640	0.60	315
21	0.85	421	1.15	581	1.50	821	2.20	1,640	2.40	2,050	0.60	315
22	0.75	376	1.40	748	1.70	990	2.30	1,830	2.40	2,050	0.60	315
23	0.70	355	1.35	713	2.00	1,340	2.30	1,830	2.40	2,050	0.60	315
24	0.70	355	1.35	713	2.30	1,830	2.10	1,480	2.30	1,830	0.55	296
25	0.70	355	1.30	678	2.30	1,830	2.10	1,480	2.30	1,830	0.55	296
26	0.65	335	1.30	678	2.30	1,830	2.15	1,560	2.30	1,830	0.55	296
27	0.70	355	1.30	678	1.80	1,090	2.20	1,640	2.30	1,830	0.55	296
28	0.65	335	1.35	713	1.80	1,090	2.30	1,830	2.30	1,830	0.50	278
29	0.80	398	1.50	821	1.80	1,090	2.40	2,050	2.05	1,410	0.50	278
30	1.00	494	1.35	713	2.15	1,560	2.50	2,290	2.00	1,340	0.50	278
31	....	....	1.30	678	....	....	2.50	2,290	1.80	1,090	....	....

	October.		November.	
1	0.50	278	0.50	278
2	0.62	323	0.50	278
3	0.55	296	0.45	261
4	0.50	278	0.45	261
5	0.50	278	0.40	244
6	0.50	278	0.40	244
7	0.50	278	0.40	244
8	0.50	278	0.40	244
9	0.45	261	0.35	229
10	0.45	261	0.45	261
11	0.45	261	0.50	278
12	0.45	261	Ice	....
13	0.45	261	....	....
14	0.40	244	....	....
15	0.40	244	....	....
16	0.40	244	....	....
17	0.40	244	....	....
18	0.40	244	....	....
19	0.40	244	....	....
20	0.40	244	....	....
21	0.40	244	....	....
22	0.45	261	....	....
23	0.40	244	....	....
24	0.40	244	....	....
25	0.45	261	....	....
26	0.45	261	....	....
27	0.55	296	....	....
28	0.60	315	....	....
29	0.60	315	....	....
30	0.60	315	....	....
31	0.55	296		

Monthly Discharge of Toby Creek at Athalmer for 1915.

(Drainage area, 180 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May	990	494	659	3.66	4.22	40,500
June	1,830	784	1,080	6.00	6.69	64,300
July	2,290	945	1,610	8.94	10.30	99,000
August	2,880	1,090	1,980	11.00	12.70	122,000
September	1,090	278	468	2.60	2.90	27,800
October	323	244	269	1.49	1.72	16,500
The period	2,880	244	1,011	5.61	38.53	370,100

NORTH VERMILION CREEK.—(3032).

Location.—The section is located about 200 yards above the highway bridge, on the road from Golden to Windermere.

Records Available.—1913-14-15.

Drainage Area.—Twenty square miles.

Climatic Conditions.—Summer days are hot, with cool nights, precipitation is light, winters more or less severe and of about four months duration.

Gauge.—Vertical staff read three to five times a week by Mr. S. B. Harrison.

Channel.—Clean and gravelly, likely to shift.

Discharge Measurements.—The 1915 rating curve is based on three measurements in 1913, taken by Provincial Water Rights Branch, six in 1914 taken by this survey, and five in 1915.

Accuracy.—"C" and "D." Generally considered to be within 15 per cent.

Discharge Measurements of North Vermilion Creek at Edgewater (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec.-ft.
1913							
Aug. 7	(Prov.) Bergoust			12.3	3.14	1.05	38.8
Sept. 15	(Prov.) Bergoust			10.9	2.78	0.95	32.2
Nov. 9	(Prov.) Bergoust			10.3	2.75	0.80	28.4
1914							
April 18	(Prov.) Bergoust		13.0	8.85	2.38	0.70	21.1
May 6	Gill	1,048	14.0	16.7	4.00	1.30	66.7
May 26	(Prov.) Bell		15.2	27.7	5.04	1.95	139.0
July 27	(Prov.) Bergoust		13.0	16.0	3.71	1.25	59.8
Aug. 24	(Prov.) Bell		13.7	13.2	2.63	1.00	34.8
Sept. 29	(Prov.) Bergoust		13.0	13.3	3.32	1.15	44.3
1915							
Feb. 27	Elliott	1,927	19.0	10.4	2.00	0.68	20.5[1]
May 2	Elliott	1,672	15.0	18.4	3.56	1.50	65.6
May 22	Elliott	1,672	14.0	17.9	4.09	1.25	73.2
July 10	Elliott	1,909	14.0	19.6	3.83	1.35	76.1
Sept. 21	(Prov.) Bergoust		13.0	10.0	2.53	0.90	25.3

[1] Ice conditions.

Daily Gauge Height and Discharge of North Vermilion Creek at Edgewater for 1915.

(Drainage area, 20 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.70	21.3	1.50	81.0	1.50	81.0	1.90	132.0	1.50	81.0	0.90	30.9
2	0.70	21.3	....	75.6	1.60	92.6	1.80	118.0	1.40	70.2	....	30.9
3	0.80	26.0	1.40	70.2	....	89.7	1.60	92.6	....	65.2	0.90	30.9
4	0.80	26.0	....	75.6	1.55	86.8	1.55	86.8	1.30	60.2	....	30.9
5	0.80	26.0	1.50	81.0	1.45	75.6	1.50	81.0	....	60.2	0.90	30.9
6	....	27.2	1.50	81.0	1.40	70.2	1.40	70.2	1.30	60.2	....	32.4
7	0.85	28.4	1.60	92.6	1.40	70.2	....	70.2	1.20	51.3	0.95	33.8
8	....	28.4	1.70	105.0	1.40	70.2	....	70.2	....	47.4	....	32.4
9	0.85	28.4	....	98.8	1.40	70.2	1.40	70.2	1.10	43.5	0.90	30.9
10	....	27.2	1.60	92.6	....	67.7	1.40	70.2	1.10	43.5	....	30.0
11	0.80	26.0	....	86.8	1.35	65.2	....	70.2	1.00	36.7	....	29.2
12	....	26.0	1.50	81.0	....	62.7	1.40	70.2	....	36.7	0.85	28.4
13	0.80	26.0	....	73.1	1.30	60.2	1.50	81.0	1.00	36.7	....	28.4
14	0.80	26.0	1.35	65.2	1.35	65.2	1.50	81.0	....	32.6	0.85	28.4
15	....	29.9	....	58.2	....	67.7	1.85	125.0	0.85	28.4	0.90	30.9
16	0.95	33.8	1.20	51.3	1.40	70.2	2.70	250.0	....	32.6	0.85	28.4
17	1.00	36.7	1.20	51.3	1.40	70.2	2.60	235.0	1.00	36.7	....	27.2
18	1.30	60.2	....	47.4	....	72.4	2.50	220.0	....	36.7	0.80	26.0
19	....	55.8	1.10	43.5	1.45	75.6	2.50	220.0	....	36.7	....	27.2
20	1.20	51.3	....	43.5	1.40	70.2	2.50	220.0	1.00	36.7	0.85	28.4
21	....	47.4	1.10	43.5	1.40	70.2	....	205.0	....	36.7	....	28.4
22	1.10	43.5	1.20	51.3	1.35	65.2	2.30	190.0	1.00	36.7	0.85	28.4
23	....	41.8	1.20	51.3	....	70.4	2.00	146.0	....	35.2	....	27.2
24	1.05	40.1	....	51.3	1.45	75.6	....	139.0	0.95	33.8	0.80	26.0
25	0.95	33.8	1.20	51.3	1.50	81.0	1.90	132.0	....	32.8	0.80	26.0
26	....	38.6	1.20	51.3	....	99.5	....	125.0	....	31.8	....	26.0
27	1.10	43.5	....	55.8	1.80	118.0	1.80	118.0	0.90	30.9	0.80	26.0
28	....	45.4	1.30	60.2	1.85	125.0	....	111.0	0.90	30.9	0.80	26.0
29	1.15	47.4	1.40	70.2	1.95	139.0	1.70	105.0	0.90	30.9	....	26.0
30	1.50	81.0	1.45	75.6	1.90	132.0	1.60	92.6	0.90	30.9	0.80	26.0
31	....	....	....	78.3	....	....	1.50	81.0	0.95	33.8	....	....

Monthly Discharge of North Vermilion Creek at Edgewater for 1915.

(Drainage area, 20 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	81.0	21.3	36.5	1.82	2.03	2,170
May	105.0	43.5	67.5	3.38	3.90	4,150
June	139.0	60.2	81.0	4.05	4.52	4,820
July	250.0	70.2	125.0	6.25	7.21	7,690
August	81.0	30.9	41.9	2.10	2.42	2,580
September	33.8	26.0	28.8	1.44	1.61	1,720
The period	250.0	21.3	63.4	3.17	21.69	23,130

SOUTH VERMILION CREEK.—(3033).

Location.—The section is about 40 feet above the highway bridge, on the Golden-Windermere road, which crosses this creek, and is about ½ mile above the mouth.

Records Available.—April to September, 1914, and April to September, 1915.

Drainage Area.—Ten square miles.

Climatic Conditions.—Summer days hot, with cool nights. Precipitation is generally light. Winter lasts about 4½ months, and is more or less severe.

Gauge.—Vertical staff read daily by Mr. Eric Smith.

Channel.—Gravelly and likely to shift.

Discharge Measurements.—The 1915 data has been prepared from a rating curve based on four measurements made by this Survey and one by the Provincial Water Rights Branch, in 1915.

Accuracy.—"C" and "D." Results considered to be within 15 or 20 per cent.

Discharge Measurements of South Vermilion at Edgewater for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
1915			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 2	Elliott.	1,672	14.0	11.6	2.84	3.80	33.0
May 22	Elliott.	1,672	18.0	10.3	3.19	3.75	32.9
July 10	Elliott	1,909	14.5	17.1	3.33	4.00	57.1
Sept. 21	(Prov.) Bergoust	....	14.0	9.30	1.86	3.55	17.3
Oct. 24	Richardson	1,929	15.0	9.75	1.43	3.51	13.9

Daily Gauge Height and Discharge of South Vermilion Creek at Edgewater for 1915.

(Drainage area, 10 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			3.80	33.4	3.90	44.0	4.15	84.5	3.90	44.0	3.62	20.3
2			3.80	33.4	3.90	44.0	4.12	78.2	3.90	44.0	3.62	20.3
3			3.80	33.4	3.90	44.0	4.10	74.0	3.90	44.0	3.60	18.9
4			3.78	31.8	3.90	44.0	4.10	74.0	3.85	38.7	3.60	18.9
5			3.78	31.8	3.90	44.0	4.08	70.6	3.85	38.7	3.60	18.9
6			3.78	31.8	3.90	44.0	4.05	65.6	3.80	33.4	3.60	18.9
7			3.80	33.4	3.92	46.6	4.02	60.6	3.80	33.4	3.60	18.9
8			3.80	33.4	3.92	46.6	4.02	60.6	3.80	33.4	3.60	18.9
9			3.82	35.5	3.90	44.0	4.00	57.2	3.80	33.4	3.60	18.9
10			3.90	44.0	3.90	44.0	4.00	57.2	3.78	31.8	3.60	18.9
11	3.50	13.8	3.90	44.0	3.85	38.7	4.00	57.2	3.78	31.8	3.60	18.9
12	3.50	13.8	3.85	38.7	3.82	35.5	3.95	50.6	3.78	31.8	3.60	18.9
13	3.50	13.8	3.80	33.4	3.80	33.4	4.00	57.2	3.75	29.4	3.60	18.9
14	3.50	13.8	3.75	29.4	3.80	33.4	4.05	65.6	3.75	29.4	3.60	18.9
15	3.55	16.4	3.75	29.4	3.82	35.5	4.10	74.0	3.70	25.3	3.60	18.9
16	3.55	16.4	3.75	29.4	3.82	35.5	4.30	121.0	3.70	25.3	3.60	18.9
17	3.60	18.9	3.72	26.9	3.82	35.5	4.40	150.0	3.70	25.3	3.60	18.9
18	3.65	22.1	3.72	26.9	3.85	38.7	4.40	150.0	3.70	25.3	3.60	18.9
19	3.65	22.1	3.72	26.9	3.85	38.7	4.30	121.0	3.70	25.3	3.60	18.9
20	3.65	22.1	3.75	29.4	3.85	38.7	4.20	95.0	3.70	25.3	3.58	17.9
21	3.65	22.1	3.78	31.8	3.85	38.7	4.20	95.0	3.70	25.3	3.58	17.9
22	3.62	20.3	3.80	33.4	3.85	38.7	4.15	84.5	3.68	24.0	3.55	16.4
23	3.60	18.9	3.80	33.4	3.90	44.0	4.10	74.0	3.68	24.0	3.55	16.4
24	3.60	18.0	3.80	33.4	3.92	46.6	4.10	74.0	3.68	24.0	3.55	16.4
25	3.60	18.9	3.81	34.5	4.00	57.2	4.15	84.5	3.65	22.1	3.55	16.4
26	3.60	18.9	3.81	34.5	4.10	74.0	4.15	84.5	3.65	22.1	3.55	16.4
27	3.60	18.9	3.85	38.7	4.15	84.5	4.00	57.2	3.65	22.1	3.55	16.4
28	3.62	20.3	3.90	44.0	4.20	95.0	4.00	57.2	3.65	22.1	3.55	16.4
29	3.62	20.3	3.00	44.0	4.20	95.0	3.95	50.6	3.65	22.1	3.55	16.4
30	3.70	25.3	3.90	34.0	4.15	84.5	3.90	44.0	3.65	22.1	3.55	16.4
31	....	....	3.88	41.9	....	....	3.90	44.0	3.62	20.3	....	....

Monthly Discharge of South Vermilion Creek at Edgewater for 1915.

(Drainage area, 10 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet
May	44.0	26.9	34.5	3.45	3.98	2,120
June	95.0	33.4	48.9	4.89	5.46	2,910
July	150.0	44.0	76.6	7.66	8.83	4,710
August	44.0	20.3	29.0	2.90	3.34	1,780
September	20.3	16.4	18.2	1.82	2.03	1,080
The period	150.0	16.4	41.4	4.14	23.64	12,600

WASHOUT CREEK.—(3054).

Location.—The section is located in wooden flume, which is about 20 feet long, and situated about 200 feet above the district schoolhouse, near Galena.

Records Available.—1914 and 1915.

Drainage Area.—Not determined.

Climatic Conditions.—See Spillimacheen river. Similar conditions prevail.

Gauge.—Vertical staff, located in the flume, and read by Mr. H. Alton.

Channel.—Straight for 10 feet above and below section. Water flows swiftly. The natural channel is rough and rocky.

Discharge Measurements.—The 1915 data has been prepared from a rating curve based on five measurements by this Survey and five by Provincial Water Rights Branch, well distributed, in 1914 and 1915.

Accuracy.—"D." This stream is subject to considerable variation, and the accuracy cannot be considered closer than 20 or 25 per cent.

General.—Studies are being made of this stream for possible irrigation and other requirements.

Discharge Measurements of Washout Creek at Galena (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 26	(Prov.) Bergoust	....	....	5.94	7.35	1.10	43.6
June 21	Elliott	1,909	5.9	7.20	7.75	1.65	55.8
Aug. 24	(Prov.) Bergoust	1,909	5.9	2.13	5.92	0.32	12.6
Oct. 7	(Prov.) Bergoust	....	....	2.00	6.10	0.30	12.2
1915							
May 2	Elliott	1,672	6.0	3.20	6.80	0.40	21.8[1]
May 22	Elliott	1,672	6.0	2.85	6.16	0.30	17.6
June 9	(Prov.) Bergoust	....	5.9	2.55	6.25	0.35	15.9
July 10	Elliott	1,909	6.0	3.00	6.66	0.50	19.9
Sept. 21	(Prov.) Bergoust	....	5.9	1.93	5.50	0.30	10.7
Oct. 22	Richardson	1,929	5.9	1.65	4.84	0.28	7.99

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[1] New gauge.

Daily Gauge Height and Discharge of Washout Creek at Galena for 1915.

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.40	14.5	0.50	18.7	0.53	20.0	0.90	38.0	......	......	6.40	14.5
2	0.40	14.5	0.54	20.5	0.53	20.0	0.90	38.0	......	......	6.40	14.5
3	0.40	14.5	0.54	20.5	0.53	20.0	0.90	38.0	......	......	6.40	14.5
4	0.40	14.5	0.54	20.5	0.58	22.3	0.80	32.9	......	......	6.40	14.5
5	0.40	14.5	0.54	20.5	0.58	22.3	0.80	32.9	......	......	6.40	14.5
6	0.40	14.5	0.54	20.5	0.52	19.6	0.70	28.0	......	......	6.40	14.5
7	0.40	14.5	0.54	20.5	0.51	19.2	0.70	28.0	......	......	6.40	14.5
8	0.40	14.5	0.54	20.5	0.44	16.2	0.70	28.0	......	......	6.40	14.5
9	0.40	14.5	0.54	20.5	0.43	15.8	0.60	23.2	......	......	6.40	14.5
10	0.40	14.5	0.60	23.3	0.43	15.8	0.50	18.7	......	......	6.40	14.5
11	0.40	14.5	0.60	23.2	0.43	15.8	0.55	21.0	......	......	6.40	14.5
12	0.40	14.5	0.54	20.5	0.43	15.8	0.55	21.0	......	......	6.40	14.5
13	0.47	17.4	0.47	17.4	0.43	15.8	0.70	28.0	6.50	18.7	6.40	14.5
14	0.47	17.4	0.47	17.4	0.43	15.8	0.80	32.9	6.50	18.7	6.40	14.5
15	0.47	17.4	0.47	17.4	0.43	15.8	Gauge washed out.		6.50	18.7	6.30	10.7
16	0.47	17.4	0.47	17.4	0.43	15.8			6.40	14.5	6.30	10.7
17	0.54	20.5	0.47	17.4	0.43	15.8	From July 15th to Aug. 13th no readings were taken.		6.40	14.5	6.30	10.7
18	0.54	20.5	0.47	17.4	0.43	15.8			6.40	14.5	6.30	10.7
19	0.54	20.5	0.47	17.4	0.51	19.2			6.40	14.5	6.30	10.7
20	0.54	20.5	0.47	17 4	0.51	19.2			6.40	14.5	6.30	10.7
21	0.54	20.5	0.47	17.4	0.57	21.8	......	......	6.40	14.5	6.30	10.7
22	0.54	20.5	0.47	17.4	0.57	21.8	......	......	6.40	14.5	6.30	10.7
23	0.47	17.4	0.47	17.4	0.57	21.8	......	......	6.40	14.5	6.30	10.7
24	0.47	17.4	0.47	17.4	0.80	21.8	......	......	6.40	14.5	6.30	10.7
25	0.47	17.4	0.47	17.4	2.20	120.0	......	......	6.40	14.5	6.30	10.7
26	0.47	17.4	0.47	17.4	2.20	120.0	......	......	6.40	14.5	6.30	10.7
27	0.47	17.4	0.47	17.4	2.00	106.0	......	......	6.40	14.5	6.30	10.7
28	0.47	17.4	0.47	17.4	1.70	85.3	......	......	6.40	14.5	6.30	10.7
29	0.47	17.4	0.53	20.0	1.40	66.0	......	......	6.40	14.5	6.30	10.7
30	0.50	18.7	0.53	20.0	1.10	48.5	......	......	6.40	14.5	6.30	10.7
31	......	......	0.53	20.0	......	......	......	......	6.40	14.5	......	......

Monthly Discharge of Washout Creek at Galena for 1915.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	20.5	14.5	16.9	......	......	1,000
May	23.2	17.4	19.0	......	......	1,170
June	120.0	15.8	33.0	......	......	1,960
September	14.5	10.7	12.5	......	......	744
The period	120.0	10.7	20.3	......	......	4,874

CRANBROOK DISTRICT.

Bull River.—(3039).

Location.—The station is near the mouth, on C.P.R. bridge, at Bull river.

Records Available.—1914 and 1915.

Drainage Area.—Four hundred and twenty square miles.

Climatic Conditions.—Summers hot and dry. Winters severe, with light snowfall at lower altitudes. Ice conditions from November to April. During this period low flow may be anticipated, and frazil ice expected.

Gauge.—A vertical staff nailed to the buttress about 100 yards below Bull River Lumber Company's dam. Daily readings.

Channel.—Straight for 100 yards below and above gauge.

Discharge Measurements.—The 1915 data is based on seven measurements made during the year.

Accuracy.—The channel is liable to shift, and peculiar conditions exist, therefore results are not guaranteed. Further study is being made.

Discharge Measurements of Bull River at Bull River for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 28	Elliott	1,672	94	504	3.48	2.10	1,740
May 14	Corbould	1,909	94	552	4.53	2.40	2,500
May 29	Elliott	1,672	94	548	5.24	2.85	2,870
June 17	Elliott	1,909	94	528	5.00	2.60	2,640
July 4	Richardson	1,929	94	535	4.63	2.65	2,480
Aug. 30	Dempster	1,927	95	405	1.58	1.15	641
Nov. 24	Richardson	1,929	94	342	1.19	0.49	407[1]

[1] Peculiar conditions owing to dam above gauge.

Daily Gauge Height and Discharge of Bull River at Bull River for 1915.

(Drainage area, 420 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	400	3.4	3,780	2.6	2,500	3.2	3,450	1.8	1,360	1.2	685
2	....	450	3.05	3,210	2.7	2,650	2.9	2,970	1.8	1,360	1.2	685
3	....	500	2.85	2,890	2.7	2,650	2.8	2,810	1.7	1,240	1.2	685
4	1.05	552	2.5	2,350	2.6	2,500	2.8	2,810	1.7	1,240	1.2	685
5	1.1	595	2.55	2,420	2.6	2,500	2.7	2,650	1.7	1,240	1.2	685
6	1.1	595	2.4	2,200	2.55	2,420	2.6	2,500	1.7	1,240	1.2	685
7	1.1	595	2.5	2,350	2.7	2,650	2.45	2,280	1.7	1,240	1.2	685
8	1.1	595	3.2	3,450	2.6	2,500	2.4	2,200	1.7	1,240	1.2	685
9	1.1	595	3.5	3,950	2.45	2,280	2.35	2,120	1.6	1,120	1.2	685
10	1.1	595	3.6	4,120	2.4	2,200	2.4	2,200	1.6	1,120	1.1	595
11	1.1	595	3.35	3,700	2.1	1,760	2.3	2,050	1.5	1,000	1.1	595
12	1.25	735	2.7	2,650	2.1	1,760	2.1	1,760	1.5	1,000	1.1	595
13	1.6	1,120	2.6	2,500	2.2	1,190	1.9	1,490	1.45	940	1.1	595
14	1.65	1,180	2.6	2,500	2.45	2,280	2.15	1,840	1.4	890	1.1	595
15	1.9	1,490	2.5	2,350	2.6	2,500	2.15	1,840	1.4	890	1.1	595
16	2.15	1,840	2.3	2,050	2.6	2,500	2.4	2,200	1.4	890	1.1	595
17	2.65	2,580	2.1	1,760	2.7	2,650	2.4	2,200	1.4	890	1.1	595
18	3.05	3,210	2.1	1,760	2.7	2,650	2.4	2,200	1.4	890	1.1	595
19	3.2	3,450	2.05	1,690	2.7	2,650	2.0	1,620	1.4	890	0.6	520
20	3.2	3,450	1.9	1,490	2.7	2,650	1.9	1,490	1.4	890	0.6	520
21	3.05	3,210	1.9	1,490	2.6	2,500	1.9	1,490	1.4	890	0.6	520
22	2.65	2,580	1.9	1.490	2.6	2,500	1.9	1,490	1.4	890	0.6	520
23	2.3	2,050	2.05	1,690	2.55	2,580	1.9	1,490	1.4	890	0.6	520
24	2.1	1,760	2.35	2,120	2.7	2,650	1.9	1,490	1.4	890	1.0	680
25	2.0	1,620	2.4	2,200	2.8	2,810	1.9	1,490	1.4	890	0.8	500
26	2.0	1,620	2.4	2,200	3.45	3,860	1.8	1,360	1.4	890	0.8	500
27	2.0	1,620	2.4	2,200	3.45	3,860	1.85	1,420	1.4	890	0.6	520
28	2.0	1,620	2.5	2,350	3.1	3,290	1.9	1,490	1.4	890	0.6	520
29	2.35	2,120	2.75	2,730	3.1	3,290	1.9	1,490	1.2	685	0.6	520
30	3.1	3,290	2.7	2,650	3.2	3,450	1.9	1,490	1.2	685	0.6	520
31	....	....	2.55	2,420	....	....	1.8	1,360	1.2	685	....	....

	October.		November.		December.							
1	0.6	520	1.1	595	0.4	335	......	......	......	......	......	......
2	0.9	585	0.9	585	0.4	335	......	......	......	......	......	......
3	0.9	585	0.9	585	0.4	335	......	......	......	......	......	......
4	0.9	585	0.9	585	0.4	335	......	......	......	......	......	......
5	0.7	620	0.9	585	0.4	335	......	......	......	......	......	......
6	0.7	620	0.9	585	0.4	335	......	......	......	......	......	......
7	0.7	620	0.9	585	0.4	335	......	......	......	......	......	......
8	0.7	620	0.7	620	0.4	335	......	......	......	......	......	......
9	0.7	620	0.6	520	0.4	335	......	......	......	......	......	......
10	0.7	620	0.6	520	0.4	335	......	......	......	......	......	......
11	0.6	520	0.6	520	0.4	335	......	......	......	......	......	......
12	0.6	520	0.6	520	0.4	335	......	......	......	......	......	......
13	0.6	520	0.6	520	0.4	335	......	......	......	......	......	......
14	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
15	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
16	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
17	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
18	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
19	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
20	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
21	0.5	425	0.6	520	0.4	335	......	......	......	......	......	......
22	0.5	425	0.5	425	0.4	335	......	......	......	......	......	......
23	0.5	425	0.5	425	0.4	335	......	......	......	......	......	......
24	0.5	425	0.5	425	0.4	335	......	......	......	......	......	......
25	0.5	425	0.5	425	0.4	335	......	......	......	......	......	......
26	0.4	335	0.5	425	0.4	335	......	......	......	......	......	......
27	....	345	0.5	425	0.4	335	......	......	......	......	......	......
28	0.8	355	0.5	425	0.4	335	......	......	......	......	......	......
29	1.20	685	0.4	335	0.4	335	......	......	......	......	......	......
30	1.4	890	0.4	335	0.4	335	......	......	......	......	......	......
31	1.2	685	....	....	0.4	335	......	......	......	......	......	......

Monthly Discharge of Bull River at Bull River for 1915.

(Drainage area, 420 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	3,450	400	1,550	3.69	4.12	92,200
May	4,120	1,490	2,470	5.88	6.78	152,000
June	3,860	1,760	2,630	6.26	6.98	156,000
July	3,450	1,360	1,960	4.67	5.38	120,000
August	1,360	685	992	2.36	2.72	61,000
September	685	500	596	1.42	1.58	35,500
The period	4,120	400	1,699	4.06	27.56	616,700

NOTE.—Drainage area in doubt. These computations not guaranteed.

CHERRY CREEK.—(3038).

Location.—Near Wasa, about 1 mile above mouth.

Records Available.—1913-14-15.

Drainage Area.—Eighty square miles.

Climatic Conditions.—Summers hot and dry, winters severe, with light snowfall.

Gauge.—A vertical staff located on highway bridge. Daily readings made by Roy Myers.

Channel.—Channel is regular and affords a good measuring section. Slight shifts are possible.

Discharge Measurements.—The 1915 curve is based on four measurements made by Provincial Water Rights Branch in 1913, three in 1914, by the B.C. Hydrometric Survey, and four during 1915.

Accuracy.—Results should be within 15 per cent.

Discharge Measurements of Cherry River at Wasa (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Inches.	Sec.-ft.
1913							
July 28	(Prov.) Hicks	....	16.5	18.5	2.12	5	39.7
Sept. 12	(Prov.) Hicks	....	16.5	15.6	1.50	2.75	25.2
Sept. 24	(Prov.) Roblin	....	16.5	16.5	1.42	3.5	23.5
Oct. 14	(Prov.) Cole	....	16.5	17.1	1.44	3.8	24.6
1914							
July 24	Gill	1,929	16.5	24.2	2.34	7.25	56.7
Sept. 25	(Prov.) Hicks	....	16.5	16.3	1.37	2.75	22.3
Aug. 31	(Prov.) Hicks	....	16.5	13.7	1.18	0.75	16.2
1915							
April 22	Elliott	1,672	16.5	29.2	2.88	9.5	84.1
May 26	Elliott	1,672	16.5	29.8	3.43	11	102
June 12	Elliott	1,909	16.5	29.8	3.46	10.75	103
Aug. 25	Dempster	1,927	16.0	16.7	1.53	2.9	26.5

Daily Gauge Height and Discharge of Cherry Creek at Wasa for 1915.

(Drainage area, 80 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.
1	....	....	10.0	90.6	11.0	104	9.0	78.1	....	54.4	1.0	17.3
2	....	....	10.0	90.6	11.0	104	9.25	81.0	....	52.0	1.0	17.3
3	....	....	10.0	90.6	11.2	107	9.75	87.3	....	49.5	1.0	17.3
4	....	....	10.0	90.6	11.0	104	9.0	78.1	....	47.0	1.5	19.4
5	....	....	9.0	78.1	11.0	104	8.75	75.2	....	44.5	1.5	19.4
6	....	....	9.0	78.1	11.5	112	8.0	67.0	....	42.0	1.5	19.4
7	....	....	9.0	78.1	12.0	120	8.75	75.2	....	39.5	2.0	21.8
8	....	....	9.0	78.1	12.0	120	9.25	81.0	1.5	36.7	2.0	21.8
9	....	....	9.5	84.1	12.0	120	9.0	78.1	4.0	33.2	2.0	21.8
10	....	....	10.0	90.6	11.0	104	9.0	78.1	4.0	33.2	2.5	24.4
11	6.0	48.2	10.0	90.6	11.0	104	8.0	67.0	4.0	33.2	2.5	24.4
12	6.0	48.2	11.0	104	11.0	104	8.0	67.0	4.0	33.2	2.5	24.4
13	6.5	52.4	11.0	104	11.0	104	8.0	67.0	3.5	30.0	3.0	27.1
14	7.0	56.9	10.75	101	10.0	90.6	9.25	81.0	3.5	30.0	3.0	27.1
15	7.0	56.9	11.0	104	10.0	90.6	9.5	84.1	3.5	30.0	3.0	27.1
16	7.0	56.9	11.0	104	10.0	90.6	10.25	93.9	3.0	27.1	3.5	30.0
17	8.0	67.0	11.0	104	10.0	90.6	10.5	97.3	3.0	27.1	3.0	27.1
18	9.0	78.1	11.0	104	10.0	90.6	10.0	90.6	3.0	27.1	3.0	27.1
19	9.0	78.1	10.0	90.6	10.0	90.6	9.5	84.1	3.0	27.1	3.0	27.1
20	9.0	78.1	10.0	90.6	10.0	90.6	9.75	87.3	3.0	27.1	3.0	27.1
21	9.0	78.1	10.0	90.6	9.0	78.1	9.0	78.1	3.5	30.0	3.0	27.1
22	9.0	78.1	10.0	90.6	8.0	67.0	9.0	78.1	3.5	30.0	3.0	27.1
23	8.5	72.4	10.5	97.3	8.0	67.0	8.5	72.4	3.0	27.1	3.0	27.1
24	8.5	72.4	10.5	97.3	8.0	67.0	8.5	72.4	2.5	24.4	3.0	27.1
25	8.5	72.4	11.0	104	8.5	72.4	8.5	72.4	2.5	24.4	3.0	27.1
26	7.8	64.4	11.0	104	12.0	120.0	8.5	72.4	2.5	24.4	3.0	27.1
27	8.0	67.0	11.0	104	12.25	124	8.0	67.0	2.5	24.4	3.0	27.1
28	8.0	67.0	11.0	104	10.75	101	8.0	67.0	2.5	24.4	3.0	27.1
29	9.0	78.1	11.8	116	10.0	90.6	8.0	67.0	2.5	24.4	3.0	27.1
30	9.5	84.1	12.0	120	9.25	81.0	7.25	59.3	2.0	21.8	3.0	27.1
31	....	....	11.8	116	....	....	7.0	56.9	1.0	17.3	....	....

Monthly Discharge of Cherry Creek at Wasa for 1915.

(Drainage area, 80 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
May.	120	78.1	96.5	1.21	1.39	5,930
June.	124	67.0	97.1	1.21	1.35	5,780
July....	97.3	56.9	76.2	0.95	1.10	4,690
August..	54.4	17.3	32.1	0.40	0.46	1,970
September.	30.0	17.3	24.6	0.31	0.35	1,460
The period	124	17.3	65.3	0.82	4.65	19,830

NOTE.—No readings were made for the first week in August, during which the gauge dropped from 7.0 to 4.5 inches. No accuracy is given for this month, as the discharges for this week were interpolated.

ELK RIVER.—(3048).

Location.—At cable station, 50 yards above traffic bridge, ¼ mile from Elko, in south-east Kootenay.

Records Available.—1914 and 1915.

Drainage Area.—One thousand six hundred square miles.

Climatic Conditions.—Summers hot and dry, winters severe, with light snowfall. Frazil ice is to be expected.

Gauge.—A chain gauge was established at the highway bridge and a vertical staff at the cable station. These were read by Mr. Jas. McKee daily.

Channel.—The channel below the bridge is confined in a canyon, and there is no possibility of shift, though log jams might occasionally affect the gauge readings. Above and below the station the channel is straight for about 40 yards. There is a distinct riffle 30 yards below the section at low water,—but this is drowned at high water by the water backing up in its endeavour to get through the narrow canyon below. The low water control below the station may shift somewhat in high water.

Discharge Measurements.—The 1915 rating curve was based on one measurement in November, 1913, six in 1914, and six well-distributed measurements in 1915. On December 18, 1914, a measurement under ice conditions gave a discharge of 630 c.f.s., and one on February 23, 1915, gave a discharge of 601 c.f.s.

Accuracy.—Gauge readings and measurements are reliable, the rating curve is satisfactory, results should be within 10 or 15 per cent.

Discharge Measurements of Elk River at Elko (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Nov. 11	Richardson & Webb	1,048	84	300	4.42	3.20	1,330
1914							
June 5	Gill	1,048	218	1,410	7.78	4.55	11,000
June 19	Gill	1,048	213	1,200	7.42	3.80	8,950
July 30	Gill	1,929	195	515	3.48	4.80	1,790
Oct. 7	Gill	1,929	194	455	2.95	3.55	1,360
Oct. 14	Gill	1,929	195	458	3.07	3.60	1,410
Dec. 18	Elliott & Corbould	1,909	75	281	2.24	2.80	630[1]
1915							
Feb. 23	Elliott & Corbould	1,909	80	348	1.73	4.40	601[1]
April 24	Elliott	1,672	210	672	4.17	4.90	2,800
May 13	Corbould	1,909	220	838	5.96	2.40	5,000
May 31	Elliott	1,672	210	755	5.24	2.00	3,940
June 15	Elliott	1,909	210	742	4.89	1.80	3,620
Aug. 28	Dempster	1,927	195	482	3.03	0.55	1,460

[1] Ice conditions.

Daily Gauge Height and Discharge of Elk River at Elko for 1915.

(Drainage area, 1,600 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	4.8	Ice conditions	5.9	Ice conditions	4.2	Ice conditions	2.85	1,060	2.2	4,580	1.95	3,960
2	4.65		5.7		3.95		3.75	1,500	2.4	5,090	2.0	4,080
3	4.5		5.4		4.0		3.65	1,440	2.35	4,960	2.1	4,330
4	4.55		5.3		4.2		3.75	1,500	2.15	4,460	2.0	4,080
5	4.75		5.0		4.2		3.7	1,470	1.95	3,960	2.0	4,080
6	4.52		5.0		4.2		3.6	1,400	2.0	4,080	1.95	3,960
7	4.5		5.05		4.0		0.4	1,340	2.1	4,330	1.95	3,960
8	4.5		5.1		3.9		0.35	1,310	2.2	4,580	1.9	3,840
9	4.5		5.1		4.0		0.3	1,280	2.35	4,960	1.9	3,840
10	4.35		5.1		4.2		0.3	1,280	2.95	6,560	1.8	3,600
11	4.3		5.0		4.25		0.3	1,280	2.95	6,560	1.7	3,370
12	4.3		4.85		4.3		0.5	1,410	2.75	6,020	1.6	3,140
13	4.35		4.85		4.15		0.75	1,660	2.45	5,220	1.55	3,030
14	4.15		5.0		4.0		0.9	1,840	2.45	5,220	1.6	3,140
15	4.15		5.1		4.2		1.0	1,980	2.35	4,960	1.75	3,480
16	4.1		5.0		4.7		1.1	2,140	2.1	4,330	1.95	3,960
17	4.15		5.0		4.0		1.35	2,610	2.0	4,080	2.0	4,080
18	4.6		4.9		3.0	1,100	1.65	2,260	1.9	3,840	2.25	4,700
19	4.5		4.85		2.9	1,070	1.95	3,960	1.7	3,370	2.35	4,960
20	4.3		4.7		2.9	1,070	2.0	4,080	1.6	3,140	2.35	4,960
21	4.1		4.6		3.0	1,100	1.9	3,840	1.55	3,030	2.3	4,830
22	4.0		4.4		3.2	1,180	1.7	3,370	1.5	2,920	2.25	4,700
23	4.0		4.4		3.2	1,180	1.5	2,920	1.5	2,920	2.25	4,700
24	4.6		4.4		3.2	1,180	1.35	2,610	1.6	3,140	2.25	4,700
25	4.8		4.35		3.1	1,140	1.3	2,510	1.6	3,140	2.95	6,560
26	......		4.2		2.9	1,070	1.3	2,510	1.7	3,370	3.75	8,800
27	5.2		4.0		2.8	1,040	1.35	2,610	1.7	3,370	3.75	8,800
28	5.3		3.9		2.9	1,070	1.35	2,610	1.8	3,600	3.35	7,660
29	5.7		......	......	2.9	1,070	1.5	2,920	2.0	4,080	3.2	7,240
30	6.0		......	......	2.8	1,040	1.95	3,960	2.0	4,080	3.1	6,970
31	5.9		......	......	2.85	1,060	......	......	1.95	3,960	......	......

	July.		August.		September.		October.		November.		December.	
1	2.9	6,420	1.3	2,510	0.4	1,340	0.15	1,220	0.35	1,310	2.75	1,020
2	2.8	6,150	1.3	2,510	0.4	1,340	0.30	1,280	0.35	1,310	2.80	1,040
3	2.6	5,620	1.2	2,320	0.4	1,340	0.30	1,280	0.30	1,280	2.85	1,060
4	2.45	5,220	1.2	2,320	0.4	1,340	0.30	1,280	0.35	1,310	2.95	1,080
5	2.35	4,960	1.15	2,280	0.4	1,340	0.30	1,280	0.35	1,310	3.10	1,140
6	2.3	4,830	1.1	2,140	0.35	1,310	0.30	1,280	0.35	1,310	3.10	1,140
7	2.25	4,700	1.0	1,980	0.35	1,310	0.25	1,260	0.30	1,280	3.05	1,120
8	2.2	4,580	0.95	1,910	0.35	1,310	0.20	1,240	0.25	1,260	3.00	1,100
9	1.9	3,840	0.9	1,840	0.32	1,290	0.20	1,240	0.20	1,240	3.30	1,230
10	1.85	3,720	0.9	1,840	0.3	1,280	0.20	1,240	0.20	1,240	3.20	1,180
11	1.8	3,600	0.85	1,780	0.3	1,280	0.15	1,220	3.20	1,180	3.10	1,140
12	1.7	3,370	0.8	1,710	0.3	1,280	0.15	1,220	3.10	1,140	3.00	1,100
13	1.55	3,030	0.8	1,710	0.2	1,240	0.10	1,200	2.90	1,070	2.95	1,080
14	1.55	3,030	0.8	1,710	0.2	1,240	0.30	1,280	2.95	1,080	2.90	1,070
15	1.55	3,030	0.8	1,710	0.15	1,220	0.30	1,280	3.10	1,140	2.80	1,040
16	1.55	3,030	0.75	1,660	0.10	1,200	0.20	1,240	3.10	1,140	2.80	1,040
17	1.5	2,920	0.7	1,600	0.12	1,210	0.10	1,200	3.10	1,140	2.70	1,010
18	1.4	2,710	0.8	1,600	0.1	1,200	0.10	1,200	3.10	1,140	2.60	980
19	1.4	2,710	0.65	1,550	0.1	1,200	0.25	1,260	3.05	1,120	2.70	1,010
20	1.3	2,510	0.65	1,550	0.1	1,200	0.35	1,310	3.00	1,100	2.80	1,040
21	1.3	2,510	0.6	1,500	0.15	1,220	0.35	1,310	3.00	1,100	2.90	1,070
22	1.3	2,510	0.6	1,500	0.15	1,220	0.35	1,310	3.00	1,100	3.00	1,100
23	1.3	2,510	0.6	1,500	0.15	1,220	0.25	1,260	3.05	1,120	2.95	1,080
24	1.3	2,510	0.6	1,500	0.22	1,250	0.25	1,260	3.10	1,140	2.95	1,080
25	1.3	2,510	0.55	1,460	0.22	1,250	0.30	1,280	3.10	1,140	3.00	1,100
26	1.3	2,510	0.5	1,410	0.2	1,240	0.30	1,280	3.00	1,100	3.00	1,100
27	1.3	2,510	0.5	1,410	0.22	1,250	0.25	1,260	2.90	1,070	2.90	1,070
28	1.3	2,510	0.45	1,380	0.2	1,240	0.30	1,280	2.75	1,020	2.80	1,040
29	1.4	2,710	0.45	1,380	0.2	1,240	0.30	1,280	2.85	1,060	2.70	1,010
30	1.5	2,920	0.45	1,380	0.15	1,220	0.30	1,280	2.90	1,070	2.70	1,010
31	1.3	2,510	0.45	1,380	......	......	0.35	1,310	......	......	2.70	1,010

Monthly Discharge of Elk River at Elko for 1915.

(Drainage area, 1,600 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	4,080	1,060	2,220	1.39	1.55	136,000
May	6,560	2,920	4,260	2.66	3.07	262,000
June	8,800	3,030	4,780	2.98	3.33	284,000
July	6,420	2,510	3,490	2.18	2.51	215,000
August	2,510	1,380	1,740	1.08	1.25	107,000
September	1,340	1,200	1,260	0.78	0.87	75,000
October	1,310	1,200	1,260	0.78	0.90	77,500
November	1,310	1,020	1,170	0.73	0.81	69,600
December	1,230	980	1,070	0.67	0.77	65,800
The period	8,800	980	2,360	1.47	15.06	1,291,900

GOLD CREEK.—(3047).

Location.—The station is at a highway bridge, ½ mile from mouth. 7 miles from International boundary line, near Newgate, in south-east Kootenay.

Records Available.—1914 and 1915.

Drainage Area.—Two hundred and thirty square miles.

Climatic Conditions.—Winters severe, with light snowfall, summers hot and dry.

Gauge.—A wooden staff, 4 feet long, located on downstream side of bridge, and read three times a week by Mr. C. Thompson.

Channel.—Gravel bed. Flow is fairly smooth. Control is a gravel bar below.

Discharge Measurements.—The 1915 curve is based on five measurements made in 1914, and five in 1915.

Accuracy.—"B" and "C." Measurements are reliable. Results are within 10 or 15 per cent.

Discharge Measurements of Gold Creek at Newgate (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 17	Gill	1,048	63.5	192	5.97	2.35	1,150
June 18	Gill	1,048	60	112	3.02	1.35	339
July 11	(Prov.)	....	62	74.4	1.65	0.75	123
July 28	Gill	1,929	62	48.5	1.11	0.37	53.8
Sept. 11	(Prov.) Hicks	....	....	30.0	0.69	0.05	20.6
1915							
April 25	Elliott	1,672	63.5	120	2.51	1.22	302
May 14	Corbould	1,909	63.5	121	2.76	1.30	335
May 30	Elliott	1,672	63.5	108	2.53	1.20	273
June 14	Elliott	1,909	63.0	86.2	1.90	0.90	164
Aug. 27	Dempster	1,927	61.0	37.6	0.92	0.10	34.4

Daily Gauge Height and Discharge of Gold Creek at Newgate for 1915.

(Drainage area, 230 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.25	41.8	1.45	397	....	270	1.1	230	....	72.1	....	31.0
2	....	56.9	....	370	1.2	270	....	212	0.5	72.1	0.1	31.0
3	0.5	72.1	1.35	342	....	250	1.0	194	....	65.0	....	31.0
4	....	110	....	329	1.1	230	....	178	0.4	57.8	0.1	31.0
5	0.85	148	1.3	316	....	212	0.9	162	....	57.8	....	31.0
6	....	141	....	293	1.0	194	....	162	0.4	57.8	0.1	31.0
7	0.8	134	1.2	270	....	194	0.9	162	....	52.0	....	31.0
8	....	134	....	293	1.0	194	....	162	0.3	46.3	....	31.0
9	0.8	134	1.3	316	....	186	0.9	162	....	46.3	0.1	31.0
10	....	141	....	316	0.95	178	....	148	0.3	46.3	....	31.0
11	0.85	148	1.3	316	....	170	0.8	134	....	46.3	0.1	31.0
12	....	199	....	329	0.9	162	....	122	0.3	46.3	....	31.0
13	1.15	250	1.35	342	0.9	162	0.7	110	....	41.8	0.1	31.0
14	....	260	....	355	....	144	....	110	0.2	37.4	....	34.1
15	1.2	270	1.4	368	....	126	0.7	110	....	37.4	0.2	37.4
16	....	293	....	368	....	108	....	110	0.2	37.4	....	40.3
17	1.3	316	1.4	368	0.6	89.4	0.7	110	....	37.4	....	43.3
18	....	403	....	355	....	99.7	....	122	....	37.4	0.3	46.3
19	1.6	490	1.35	342	0.7	110	0.8	134	0.2	37.4	....	52.0
20	....	444	....	342	....	99.7	....	122	0.3	46.3	0.4	57.8
21	1.45	397	1.35	342	0.6	89.4	0.7	110	....	43.3	....	57.8
22	....	444	....	342	....	89.4	....	99.7	....	40.3	0.4	57.8
23	1.6	490	1.35	342	0.6	89.4	0.6	89.4	0.2	37.4	....	65.0
24	....	403	....	370	....	80.7	....	80.7	....	37.4	0.5	72.1
25	1.3	316	1.45	397	0.5	72.1	0.5	72.1	0.2	37.4	....	72.1
26	....	293	....	383	....	194	....	80.7	....	35.2	0.5	72.1
27	1.2	270	1.4	368	1.3	316	0.6	89.4	....	33.1	....	67.3
28	....	319	....	342	....	293	....	89.4	0.1	31.0	....	62.5
29	1.4	368	1.3	316	1.2	270	0.6	89.4	....	31.0	0.4	57.8
30	....	382	....	293	....	250	....	80.7	....	31.0	....	57.8
31	....	....	1.2	270	....	....	0.5	72.1	0.1	31.0	....	....

Monthly Discharge of Gold Creek at Newgate for 1915.

(Drainage area, 230 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	490.0	41.8	262.0	1.14	1.27	15,600
May	397.0	270.0	338.0	1.47	1.69	20,800
June	316.0	72.1	173.0	0.75	0.84	10,300
July	230.0	72.1	126.0	0.55	0.63	7,750
August	72.1	31.0	44.1	0.19	0.22	2,710
September	72.1	31.0	45.2	0.20	0.22	2,690
The period	490.0	31.0	164.7	0.71	4.87	59,850

KOOTENAY RIVER.—(3041).

Location.—This station is at the highway bridge, near Wardner.

Records Available.—1914 and 1915.

Drainage Area.—Five thousand two hundred square miles.

Climatic Conditions.—Summers hot and dry. Winters severe. The river is generally affected by ice from December to March. A precipitation of from 16 to 20 inches may be expected. Frazil ice occurs.

Gauge.—A vertical staff, 12 feet long, is nailed to one of the bridge piers, and read daily by Mrs. C. Barnes.

Channel.—The channel is straight and uniform.

Discharge Measurements.—The 1915 rating curve is based on fifteen measurements made during 1913-14-15.

Accuracy.—"A" and "B." Gauge readings and measurements are reliable. The rating curve is satisfactory, and results are considered to be within 5 and 10 per cent.

Discharge Measurements of Kootenay River at Wardner (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1913							
Nov. 13	Webb & Richardson	1,048	460	2,100	1.64	2.00	3,640
1914							
May 19	Gill	1,048	482	4,860	4.83	8.00	23,500
June 7	Gill	1,048	482	4,840	4.85	8.00	23,500
June 15	Gill	1,048	483	5,450	5.55	9.30	30,200
June 20	Gill	1,048	488	6,070	6.41	10.65	38,900
July 25	Gill	1,929	467	3,350	3.38	5.00	11,300
July 31	Gill	1,929	467	3,210	3.33	4.70	10,700
Oct. 7	Gill	1,929	464	2,490	2.08	2.95	5,210
Oct. 13	Gill	1,929	465	2,460	2.11	2.88	5,180
Dec. 19	Elliott	1,909	134	774	2.11	1.70	1,640[1]
1915							
Feb. 23	Elliott & Corbould	1,909	200	927	1.95	1.10	1,810[1]
April 27	Elliott	1,672	235	2,720	2.74	3.80	7,400
May 29	Elliott	1,672	470	3,600	4.11	5.90	14,800
June 16	Elliott	1,909	470	3,460	3.82	5.60	13,200
Aug. 29	Dempster	1,927	464	2,690	2.56	3.60	6,870

[1] Ice conditions.

Daily Gauge Height and Discharge of Kootenay River at Wardner for 1915.

(Drainage area, 5,200 square miles.)

Day.	March.		April.		May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.0	1,650	1.35	2,210	5.35	12,400	5.5	13,000	7.05	19,000	5.28	12,200
2	1.0	1,650	1.4	2,300	5.7	13,800	5.65	13,600	7.0	18,700	5.3	12,300
3	0.92	1,530	1.5	2,480	5.45	12,800	5.85	14,200	6.78	17,700	5.25	12,200
4	0.92	1,530	1.85	3,110	5.12	11,800	5.8	14,100	6.55	16,800	5.15	11,800
5	0.95	1,580	2.07	3,540	4.85	11,000	5.9	14,400	6.4	16,200	4.98	11,300
6	0.98	1,620	2.1	3,600	4.7	10,500	5.92	14,500	6.5	16,600	4.72	10,600
7	1.0	1,650	2.12	3,640	4.75	10,600	5.92	14,500	6.45	16,400	4.6	10,200
8	0.95	1,580	2.12	3,640	5.38	12,500	6.15	15,400	6.35	16,000	4.52	9,960
9	0.9	1,500	2.12	3,640	6.12	15,300	6.0	14,800	6.15	15,400	4.48	9,840
10	0.9	1,500	2.1	3,600	6.55	16,800	5.62	13,500	6.05	15,000	4.42	9,660
11	0.98	1,620	2.15	3,700	6.5	16,600	5.32	12,400	5.92	14,500	4.32	9,360
12	0.98	1,620	2.18	3,770	6.05	15,000	5.05	11,600	5.5	13,000	4.25	9,150
13	1.0	1,650	2.38	4,200	5.55	13,200	4.92	11,200	5.18	11,900	4.2	9,000
14	0.97	1,600	2.65	4,820	5.4	12,600	5.02	11,500	5.25	12,200	4.2	9,000
15	1.05	1,720	2.85	5,300	5.4	12,600	5.25	12,200	5.62	13,500	4.15	8,850
16	1.05	1,720	3.1	6,000	5.2	12,000	5.58	13,300	6.12	15,300	4.2	9,000
17	1.05	1,720	3.6	7,200	4.92	11,200	5.82	14,200	6.35	16,000	4.1	8,700
18	1.2	1,960	4.3	9,300	4.72	10,600	6.05	15,000	6.45	16,400	4.0	8,400
19	1.1	1,800	4.9	11,100	4.6	10,200	6.1	15,200	6.32	16,000	4.0	8,400
20	1.15	1,880	5.18	11,900	4.5	9,900	5.9	14,000	6.15	15,400	3.95	8,250
21	1.2	1,960	5.2	12,000	4.45	9,750	5.82	14,200	6.02	15,000	4.02	8,460
22	1.25	2,040	4.82	10,900	4.65	10,400	5.8	14,100	6.0	14,800	3.98	8,340
23	1.4	2,300	4.4	9,600	4.95	11,400	5.8	14,100	6.0	14,800	3.9	8,100
24	1.52	2,520	4.13	8,790	5.1	11,700	6.0	14,800	5.8	14,100	3.9	8,100
25	1.57	2,610	3.95	8,250	5.25	12,200	6.25	15,800	5.45	12,800	3.8	7,800
26	1.5	2,480	3.85	7,950	5.28	12,200	7.0	18,700	5.4	12,600	3.75	7,650
27	1.37	2,250	3.85	7,950	5.2	12,000	7.68	21,800	5.32	12,400	3.7	7,500
28	1.32	2,160	3.88	8,040	5.25	12,200	7.25	19,800	5.6	13,400	3.62	7,260
29	1.32	2,160	3.92	8,160	5.9	14,400	7.08	19,100	5.58	13,300	3.6	7,200
30	1.35	2,210	4.42	9,660	5.95	14,600	7.05	19,000	5.5	13,000	3.58	7,160
31	1.38	2,270	....	....	5.65	13,600	....	....	5.28	12,200	3.52	7,040

	September.		October.		November.		December.					
1	3.60	7,200	2.48	4,420	2.70	4,940	1.65	2,750	....	....	....	....
2	3.48	6,940	2.48	4,420	2.65	4,820	1.65	2,750	....	....	....	....
3	3.40	6,700	2.62	4,750	2.52	4,520	1.65	2,750	....	....	....	....
4	3.35	6,600	2.70	4,940	2.45	4,360	1.65	2,750	....	....	....	....
5	3.18	6,240	2.65	4,820	2.40	4,240	1.62	2,700	....	....	....	....
6	3.15	6,150	2.55	4,580	2.40	4,240	1.60	2,660	....	....	....	....
7	3.10	6,000	2.52	4,520	2.40	4,240	1.60	2,660	....	....	....	....
8	3.02	5,760	2.42	4,290	2.35	4,130	1.60	2,660	....	....	....	....
9	2.90	5,430	2.35	4,130	2.32	4,060	1.60	2,660	....	....	....	....
10	2.80	5,180	2.30	4,020	2.25	3,920	1.62	2,700	....	....	....	....
11	2.72	4,990	2.30	4,020	2.25	3,920	1.50	2,480	....	....	....	....
12	2.70	4,940	2.22	3,850	2.25	3,920	1.50	2,480	....	....	....	....
13	2.70	4,940	2.20	3,810	2.15	3,700	1.50	2,480	....	....	....	....
14	2.60	4,700	2.18	3,770	2.00	3,400	1.58	2,620	....	....	....	....
15	2.48	4,420	2.15	3,700	1.90	3,210	1.60	2,660	....	....	....	....
16	2.42	4,290	2.12	3,640	1.90	3,210	1.60	2,660	....	....	....	....
17	2.45	4,360	2.10	3,600	1.92	3,250	1.60	2,660	....	....	....	....
18	2.45	4,360	2.08	3,500	1.95	3,300	1.60	2,660	....	....	....	....
19	2.45	4,360	2.10	3,600	2.02	3,440	1.50	2,480	....	....	....	....
20	2.45	4,360	2.12	3,640	1.92	3,250	1.50	2,480	....	....	....	....
21	2.45	4,360	2.15	3,700	1.82	3,060	1.50	2,480	....	....	....	....
22	2.40	4,240	2.20	3,810	1.83	3,080	1.50	2,480	....	....	....	....
23	2.40	4,240	2.20	3,810	1.95	3,300	1.50	2,480	....	....	....	....
24	2.40	4,240	2.22	3,850	1.95	3,300	1.45	2,390	....	....	....	....
25	2.45	4,360	2.28	3,980	1.90	3,210	1.45	2,390	....	....	....	....
26	2.50	4,470	2.30	4,020	1.87	3,150	1.45	2,390	....	....	....	....
27	2.50	4,470	2.25	3,920	1.85	3,120	1.45	2,390	....	....	....	....
28	2.52	4,520	2.32	4,060	1.85	3,120	1.45	2,390	....	....	....	....
29	2.55	4,580	2.58	4,650	1.80	3,020	1.42	2,340	....	....	....	....
30	2 50	4,470	2.75	5,060	1 72	2,880	1.40	2,300	....	....	....	....
31	....	....	2.75	5,060	....	....	1.32	2,160	....	....	....	....

Monthly Discharge of Kootenay River at Wardner for 1915.

(Drainage area, 5,200 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	2,610	1,500	1,870	0.36	0.42	115,000
April	12,000	2,210	6,340	1.22	1.36	377,000
May	16,800	9,750	12,400	2.38	2.74	762,000
June	21,800	11,200	14,800	2.85	3.18	881,000
July	19,000	11,900	14,900	2.87	3.31	916,000
August	12,300	7,040	9,120	1.76	2.03	561,000
September	7,200	4,240	5,060	0.97	1.08	301,000
October	5,060	3,560	4,130	0.79	0.91	254,000
November	4,940	2,880	3,640	0.70	0.78	217,000
December	2,750	2,160	2,540	0.49	0.57	156,000
The period	21,800	1,500	7,480	1.44	16.38	4,540,000

LINKLATER CREEK.—(3045).

Location.—The section is at Smith's ranch, six miles from Newgate.

Records Available.—1913-14-15.

Drainage Area.—Forty-two square miles.

Climatic Conditions.—Precipitation is light, usually not in excess of 20 inches. Summers hot and dry, winters severe.

Gauge.—A 3-foot enamel gauge is nailed to a footbridge, and is read daily by Mr. Alex. F. Smith.

Channel.—Smooth and unbroken.

Discharge Measurements.—The 1915 data was prepared from a rating curve based on five measurements in 1914 and five in 1915.

Accuracy.—"C." Measurements and readings reliable. Results within 15 per cent.

Discharge Measurements of Linklater Creek at Newgate (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 17	Gill	1,048	20.0	30.0	3.30	1.30	99.0
June 18	Gill	1,048	20.0	21.5	2.66	0.85	57.1
July 11	(Prov.) Hicks	....	20.0	13.0	1.66	0.50	21.7
July 28	Gill	1,929	20.0	10.6	1.35	0.40	14.3
Sept. 11	(Prov.) Hicks	....	....	8.70	1.41	0.30	12.3
1915							
April 25	Elliott	1,672	20.0	14.2	1.80	0.56	25.6
May 14	Corbould	1,909	20.0	15.3	2.34	0.65	35.8
May 30	Elliott	1,672	20.0	16.3	2.27	0.65	37.0
June 14	Elliott	1,909	26.0	12.9	1.84	0.48	23.7
Aug. 28	Dempster	1,927	19.7	11.8	0.88	0.44	10.4

Daily Gauge Height and Discharge of Linklater Creek at Newgate for 1915.

(Drainage area, 42 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.33	11.7	0.78	47.9	0.6	33.6	0.62	35.4	0.4	18.2	0.44	10.4
2	0.34	12.1	0.68	38.5	0.6	33.6	0.6	33.6	0.39	17.6	0.44	10.4
3	0.35	12.5	0.64	34.9	0.6	33.6	0.58	31.9	0.39	17.6	0.44	10.4
4	0.35	12.5	0.6	31.4	0.68	40.8	0.55	29.3	0.35	15.3	0.44	10.4
5	0.35	12.5	0.59	30.5	0.55	29.3	0.7	42.7	0.35	15.3	0.44	10.4
6	0.35	12.5	0.59	30.5	0.55	29.3	0.52	26.8	0.35	15.3	0.44	10.4
7	0.35	12.5	0.59	30.5	0.55	29.3	0.57	31.0	0.35	15.3	0.44	10.4
8	0.38	14.0	0.65	35.8	0.55	29.3	0.55	29.3	0.35	15.3	0.44	10.4
9	0.4	15.0	0.7	40.3	0.52	26.8	0.6	33.6	0.35	15.3	0.5	12.8
10	0.41	15.6	0.71	41.2	0.5	25.2	0.58	31.9	0.3	12.8	0.5	12.8
11	0.41	15.6	0.69	39.4	0.5	25.2	0.55	29.3	0.3	12.8	0.5	12.8
12	0.41	15.6	0.67	37.6	0.5	25.2	0.55	29.3	0.3	12.8	0.47	11.5
13	0.45	18.0	0.66	36.7	0.48	23.7	0.5	25.2	0.4	10.4	0.45	10.7
14	0.55	24.8	0.66	36.7	0.5	25.2	0.5	25.2	0.5	12.8	0.5	12.8
15	0.6	28.9	0.75	45.0	0.5	25.2	0.49	24.4	0.45	10.7	0.5	12.8
16	0.65	33.2	0.72	42.2	0.5	25.2	0.48	23.7	0.45	10.7	0.5	12.8
17	0.7	37.7	0.7	40.3	0.5	25.2	0.52	26.8	0.45	10.7	0.47	11.5
18	0.74	41.3	0.7	40.3	0.45	21.5	0.5	25.2	0.45	10.7	0.47	11.5
19	0.84	50.9	....	38.0	0.45	21.5	0.48	23.7	0.45	10.7	0.45	10.7
20	0.8	47.0	0.65	35.8	0.43	20.1	0.45	21.5	0.5	12.8	0.45	10.7
21	0.72	39.5	0.65	35.8	0.42	19.5	0.45	21.5	0.55	15.3	0.45	10.7
22	0.68	35.9	0.68	38.5	0.41	18.8	0.45	21.5	0.55	15.3	0.45	10.7
23	0.6	28.9	0.72	42.2	0.4	18.2	0.42	19.5	0.5	12.8	0.45	10.7
24	0.56	25.6	0.75	45.0	0.4	18.2	0.4	18.2	0.5	12.8	0.5	12.8
25	0.56	25.6	0.78	47.9	0.45	21.5	0.4	18.2	0.5	12.8	0.45	10.7
26	0.55	24.8	0.72	42.2	0.82	54.3	0.4	18.2	0.5	12.8	0.45	10.7
27	0.59	28.0	0.7	40.3	0.92	64.4	0.4	18.2	0.45	10.7	0.45	10.7
28	0.57	26.4	0.7	40.3	0.82	54.3	0.42	19.5	0.45	10.7	0.45	10.7
29	0.62	30.6	0.68	38.5	0.72	44.6	0.4	18.2	0.45	10.7	0.45	10.7
30	0.75	42.3	0.65	35.8	0.68	40.8	0.4	18.2	0.44	10.4	0.45	10.7
31	....	....	0.6	31.4	....	....	0.4	18.2	0.44	10.4	....	....

Monthly Discharge of Linklater Creek at Newgate for 1915.

(Drainage area, 42 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	50.9	11.7	25.0	0.60	0.67	1,490
May	47.9	30.5	38.4	0.91	1.05	2,360
June	64.4	18.2	30.1	0.72	0.80	1,790
July	42.7	18.2	25.5	0.60	0.69	1,570
August	18.2	10.4	13.2	0.31	0.36	812
September	12.8	10.4	11.2	0.27	0.30	666
The period	64.4	10.4	23.9	0.57	3.87	8,688

MARK CREEK.—(3037).

Location.—The section is near the mouth of the creek, at Marysville, about 14 miles from Cranbrook.

Records Available.—1914 and 1915.

Drainage Area.—Ninety square miles.

Climatic Conditions.—Precipitation is light, seldom over 20 inches. The summers are hot and dry, the winters severe. The creek freezes over in November or December, till March. Frazil ice is to be expected.

Gauge.—Enamel gauge, 6 feet long, is read daily by Mr. M. W. Burdette.

Channel.—Straight and rocky, the flow is generally broken. The section may fill, but the control appears permanent.

Discharge Measurements.—The 1915 rating curve was based on eight measurements made in 1914 and five in 1915.

Co-operation.—This station was maintained by co-operation with the Provincial Water Rights Branch, during 1914.

Accuracy.—"B." The rating curve is satisfactory, and results are considered to be within 10 per cent.

Discharge Measurements of Mark Creek at Marysville (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 1	Richardson	1,048	20.0	41.4	2.66	1.68	110.0
May 28	Gill	1,537	25.0	57.9	4.08	2.20	236.0
July 3	(Prov.) Hicks	....	24.0	55.4	4.02	2.10	223.0
July 24	Gill	1,929	16.0	34.1	1.92	1.40	56.4
Sept. 1	(Prov.) Hicks	....	....	22.2	0.77	1.00	17.2
Sept. 29	(Prov.) Hicks	....	....	26.2	1.05	1.20	27.4
Oct. 10	Gill	1,929	19.5	28.4	0.86	1.12	24.2
Oct. 16	Gill	1,929	19.5	29.4	0.99	1.22	29.1
1915							
Feb. 21	Elliott & Corbould	1,909	21.0	23.0	0.48	1.25	11.0[1]
April 22	Elliott	1,672	20.0	41.5	2.83	2.10	118.0
May 26	Elliott	1,672	20.0	44.4	3.08	2.18	137.0
June 13	Elliott	1,909	20.0	39.7	2.43	2.00	96.3
Aug. 26	Dempster	1,927	21.0	29.5	0.81	1.16	26.4

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[1] Ice conditions.

Daily Gauge Height and Discharge of Mark Creek at Marysville for 1915.

(Drainage area, 90 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.52	25.0	2.32	170	2.2	141	1.9	78.2	1.75	51.5	1.46	20.8
2	1.5	23.5	2.28	160	2.18	136	1.89	76.2	1.72	47.0	1.44	19.6
3	1.52	25.0	2.28	160	2.18	136	1.88	74.3	1.72	47.0	1.41	18.1
4	1.58	30.0	2.02	102	2.14	127	1.85	68.6	1.65	37.7	1.41	18.1
5	1.62	34.2	2.15	130	2.22	146	1.89	76.2	1.65	37.7	1.41	18.1
6	1.62	34.2	2.12	123	2.28	160	1.87	72.4	1.61	33.1	1.42	18.6
7	1.65	37.7	2.02	102	2.32	170	1.83	65.0	1.58	30.0	1.44	19.6
8	1.61	33.1	2.25	153	2.25	153	1.8	59.7	1.59	31.0	1.45	20.2
9	1.61	33.1	2.4	191	2.15	130	1.8	59.7	1.55	27.4	1.48	22.1
10	1.61	33.1	2.36	180	2.1	119	1.82	63.2	1.55	27.4	1.48	22.1
11	1.63	35.3	2.28	160	2.02	102	1.78	56.3	1.54	26.6	1.45	20.2
12	1.68	41.5	2.21	144	1.98	94	1.78	56.3	1.52	25.0	1.45	20.2
13	1.72	47.0	2.18	136	1.98	94	1.78	56.3	1.51	24.2	1.46	20.8
14	1.78	56.3	2.22	146	2.0	98	1.8	59.7	1.5	23.5	1.44	19.6
15	1.8	59.7	2.25	153	2.08	114	1.78	56.3	1.48	22.1	1.44	19.6
16	1.88	74.3	2.18	136	2.0	98	1.81	61.4	1.48	22.1	1.46	20.8
17	2.01	100	2.08	114	2.0	98	1.81	61.4	1.5	23.5	1.46	20.8
18	2.12	123	2.08	114	1.98	94	1.86	70.5	1.5	23.5	1.45	20.2
19	2.26	156	2.08	114	2.06	110	1.82	63.2	1.49	22.8	1.44	19.6
20	2.28	160	2.01	100	1.98	94	1.75	51.5	1.52	25.0	1.41	18.1
21	2.28	160	2.08	114	1.9	78.2	1.75	51.5	1.51	24.2	1.41	18.1
22	2.18	136	2.05	108	1.9	78.2	1.74	50.0	1.48	22.1	1.38	16.6
23	2.08	114	2.05	108	1.92	82.2	1.72	47.0	1.5	23.5	1.4	17.7
24	2.02	102	2.14	127	2.01	100	1.68	41.5	1.48	22.1	1.46	20.8
25	1.98	94	2.18	136	2.18	136	1.72	47.0	1.48	22.1	1.52	25.0
26	2.0	98	2.09	116	2.08	114	1.65	37.7	1.48	22.1	1.56	28.2
27	2.04	106	2.09	116	2.08	114	1.75	51.5	1.5	23.5	1.56	28.2
28	2.08	114	2.21	144	1.95	88.1	1.72	47.0	1.48	22.1	1.55	27.4
29	2.08	114	2.25	153	1.93	84.2	1.76	53.1	1.45	20.2	1.55	27.4
30	2.22	146	2.2	141	1.9	78.2	1.71	45.6	1.42	18.6	1.52	25.0
31	....	....	2.18	136	....	....	1.74	50.0	1.44	19.6	....	....

	October.		November.		December.	
1	1.51	24.2	1.45	20.2	1.41	18.1
2	1.57	29.1	1.45	20.2	1.34	15.5
3	1.54	26.6	1.48	22.1	1.40	17.6
4	1.52	25.0	1.48	22.1	1.40	17.6
5	1.52	25.0	1.44	19.6	1.40	17.6
6	1.48	22.1	1.44	19.6	1.40	17.6
7	1.46	20.8	1.41	18.1	1.38	16.6
8	1.46	20.8	1.41	18.1	1.40	17.6
9	1.44	19.6	1.40	17.6	1.40	17.6
10	1.46	20.8	1.40	17.6	1.40	17.6
11	1.44	19.6	1.40	17.6	1.40	17.6
12	1.40	17.6	1.38	16.6	....	17.6
13	1.42	18.6	1.38	16.6	1.40	17.6
14	1.45	20.2	1.38	16.6	1.40	17.6
15	1.42	18.6	1.38	16.6	1.40	17.6
16	1.44	19.6	1.38	16.6	1.40	17.6
17	1.45	20.2	1.38	16.6	1.40	17.6
18	1.45	20.2	1.38	16.6	1.45	20.2
19	1.52	25.0	1.38	16.6	....	18.6
20	1.48	22.1	1.38	16.6	1.40	17.6
21	1.48	22.1	1.36	15.8	1.40	17.6
22	1.48	22.1	1.38	16.6	1.40	17.6
23	1.46	20.8	1.40	17.6	1.40	17.6
24	1.45	20.2	1.42	18.6	Ice	Ice
25	1.45	20.2	1.42	18.6	Ice	Ice
26	1.45	20.2	1.40	17.6	Ice	Ice
27	1.46	20.8	1.40	17.6	Ice	Ice
28	1.45	20.2	1.40	17.6	Ice	Ice
29	1.50	23.5	....	17.6	Ice	Ice
30	1.52	25.0	....	18.1	Ice	Ice
31	1.52	25.0	....	....	Ice	Ice

Monthly Discharge of Mark Creek at Marysville for 1915.

(Drainage area, 90 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	160.0	23.5	[illegible].2	0.87	0.97	4,650
May	191.0	102.0	135.0	1.50	1.73	8,300
June	170.0	78.2	112.0	1.24	1.38	6,660
July	78.2	37.7	58.3	0.65	0.75	3,580
August	51.5	18.6	27.4	0.30	0.35	1,680
September	28.2	16.6	21.0	0.23	0.37	1,250
October	29.1	17.6	21.8	0.24	0.28	1,340
November	22.1	15.8	17.9	0.20	0.22	1,060
The period	191.0	15.8	58.9	0.65	6.05	28,520

MOYIE RIVER.—(3056).

Location.—The section is at the International boundary, at highway bridge, near Kingsgate.

Records Available.—July to December, 1914, and all of 1915.

Drainage Area.—Five hundred and seventy square miles.

Climatic Conditions.—Winters and summers are temperate. In summer hot days occur, but the evenings are cool. As a rule the river does not freeze over, but frazil ice is to be expected.

Gauge.—A vertical staff is attached to the abutment of the bridge, and daily readings were made by Mr. John Dunlop.

Channel.—The flow at the section is swift, over gravel and small boulders. Straight above and below for 200 feet.

Discharge Measurements.—The 1915 data is based on a rating curve prepared from eight measurements made during the year.

Accuracy.—"C." Meterings are reliable. Gauge readings taken daily. Results are considered to be within 15 per cent.

General.—The Moyie rises in the summit of the Purcell mountains, flows easterly into Moyie lake, thence south-westerly and crosses the International boundary near Kingsgate. In Canada it drains approximately 570 square miles. Studies are being carried on to meet the possible requirements of lumbering and mining industries.

Discharge Measurements of Moyie River at Kingsgate for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
1915			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 20	Elliott	1,909	80.0	66.0	2.14	0.65	142
April 21	Elliott	1,672	97.5	370.0	6.42	3.40	2,370
June 2	Elliott	1,672	97.5	270	5.17	2.55	1,390
July 23	Elliott	1,909	92.5	133	2.77	1.20	370
July 23	Elliott	1,909	142.0	136	2.31	1.45	314[1]
Aug. 24	Dempster	1,927	83.0	80.0	2.24	0.78	179
Aug. 23	Dempster	1,927	160.0	104.0	1.78	0.80	186[1]
Nov. 24	Dempster	1,927	81.0	88.7	2.42	0.89	215

[1] At American bridge.

Daily Gauge Height and Discharge of Moyie River at Kingsgate for 1915.

(Drainage area, 570 square miles.)

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.1	Ice	1.8	Ice	0.65	142	1.35	424	3.0	1,890	2.6	1,440
2	3.0	Ice	1.65	Ice	0.6	129	1.60	573	3.1	2,010	2.5	1,340
3	2.8	Ice	1.5	Ice	0.6	129	1.85	748	3.0	1,890	2.4	1,240
4	2.6	Ice	1.4	Ice	0.6	129	2.0	868	2.9	1,770	2.3	1,140
5	2.4	Ice	1.4	Ice	0.6	129	2.0	868	2.85	1,720	2.25	1,100
6	2.0	Ice	1.45	Ice	0.6	129	2.0	868	2.8	1,660	2.2	1,050
7	1.2	Ice	1.5	Ice	0.6	129	2.0	868	2.75	1,600	2.3	1,140
8	0.85	205	1.55	Ice	0.65	142	2.0	868	2.75	1,600	2.2	1,050
9	0.8	187	1.7	Ice	0.7	156	1.9	786	2.8	1,660	2.15	1,000
10	0.8	187	1.8	Ice	0.7	156	1.9	786	2.9	1,770	2.1	958
11	0.8	187	1.9	Ice	0.7	156	2.2	1,050	2.85	1,720	2.0	868
12	0.75	172	2.0	Ice	0.7	156	2.75	1,600	2.8	1,660	2.0	868
13	0.75	172	2.0	Ice	0.7	156	2.7	1,550	2.85	1,720	1.9	786
14	0.7	156	2.0	Ice	0.75	172	2.7	1,550	2.9	1,770	1.8	710
15	0.75	172	1.7	Ice	0.8	187	2.8	1,660	5.25	2,190	1.75	674
16	0.75	172	1.4	Ice	0.85	205	2.95	1.830	3.4	2,370	1.7	639
17	0.7	156	0.9	223	0.95	242	3.1	2,010	3.45	2,430	1.65	606
18	0.75	172	0.8	187	1.05	283	3.3	2,250	3.25	2,190	1.6	573
19	0.75	172	0.7	156	1.1	304	3.6	2,620	3.1	2,010	1.6	573
20	0.8	187	0.65	142	1.15	326	3.4	2,370	3.0	1,890	1.6	573
21	0.8	187	0.6	129	1.2	348	3.4	2,370	3.05	1,950	1.6	573
22	0.85	205	0.6	129	1.35	424	3.2	2,130	3.1	2,010	1.55	542
23	0.8	187	0.65	142	1.45	480	3.0	1,890	3.0	1,890	1.5	510
24	0.8	187	0.7	156	1.5	510	2.9	1,770	3.0	1,890	1.45	480
25	0.9	223	0.65	142	1.4	451	2.8	1,660	3.0	1,890	1.7	639
26	1.1	Ice	0.7	156	1.35	424	2.7	1,550	2.9	1,770	2.0	868
27	1.2	Ice	....	156	1.3	397	2.65	1,500	2.8	1,660	2.3	1,140
28	1.4	Ice	0.7	156	1.25	372	2.65	1,500	2.75	1,600	2.15	1,000
29	1.9	Ice	....	....	1.25	372	2.6	1,440	2.95	1,830	2.0	868
30	1.9	Ice	....	....	1.3	397	2.9	1,770	2.9	1,770	1.9	786
31	1.85	Ice	....	....	1.3	397	....	....	2.8	1,660	....	....

	July.		August.		September.		October.		November.		December.	
1	1.8	710	1.2	348	0.65	142	0.7	156	0.85	205	0.90	223
2	1.75	674	1.15	326	0.65	142	0.75	172	0.85	205	0.95	242
3	1.7	639	1.1	304	0.6	129	0.8	187	0.9	223	1.00	262
4	1.6	573	1.05	283	0.6	129	0.8	187	0.95	242	0.90	223
5	1.3	397	1.0	262	0.6	129	0.75	172	1.0	262	0.85	205
6	1.05	283	1.0	262	0.6	129	0.75	172	1.0	262	0.80	187
7	0.95	242	1.0	262	0.6	129	0.75	172	1.0	262	0.80	187
8	0.9	223	1.0	262	0.55	117	0.7	156	1.05	283	0.80	187
9	1.15	326	0.95	242	0.6	129	0.7	156	1.0	262	0.90	223
10	1.45	480	0.95	242	0.65	142	0.7	156	1.0	262	0.90	223
11	1.4	451	0.9	223	0.65	142	0.7	156	0.95	242	0.95	242
12	1.35	424	0.85	205	0.65	142	0.7	156	0.95	242	1.00	262
13	1.3	397	0.85	205	0.65	142	0.7	156	0.9	223	1.10	304
14	1.35	424	0.8	187	0.65	142	0.75	172	0.9	223	1.10	304
15	1.4	451	0.8	187	0.65	142	0.75	172	0.9	223	1.00	262
16	1.35	424	0.8	187	0.7	156	0.75	172	0.85	205	0.90	223
17	1.4	451	0.8	187	0.7	156	0.75	172	0.8	187	0.85	205
18	1.35	424	0.8	187	0.7	156	0.75	172	0.85	205	0.85	205
19	1.2	348	0.8	187	0.65	142	0.8	187	0.85	205	0.80	187
20	1.3	397	0.8	187	0.6	129	0.8	187	0.9	223	0.85	205
21	1.25	372	0.8	187	0.65	142	0.85	205	0.9	223	0.80	187
22	1.2	348	0.8	187	0.7	156	0.85	205	0.85	205	0.90	223
23	1.15	326	0.8	187	0.75	172	0.8	187	0.95	242	0.95	242
24	1.1	304	0.8	187	0.8	187	0.8	187	0.9	223	1.00	262
25	1.15	326	0.8	187	0.75	172	0.8	187	0.85	205	0.90	223
26	1.15	326	0.75	172	0.7	156	0.85	205	0.85	205	1.00	Ice
27	1.2	348	0.75	172	0.75	172	0.9	223	0.8	187	1.10	Mean
28	1.35	424	0.7	156	0.75	172	0.9	223	0.95	242	1.30	esti-
29	1.2	348	0.7	156	0.7	156	0.85	205	1.0	262	1.20	mated
30	1.15	326	0.7	156	0.7	156	0.85	205	0.95	242	2.20	at
31	1.2	348	0.65	142	....	....	0.85	205	....	....	2.30	180

Monthly Discharge of Moyie River at Kingsgate for 1915.

(Drainage area, 570 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
March	510	129	262	0.46	0.53	16,100
April	2,620	424	1,460	2.56	2.86	86,900
May	2,430	1,600	1,850	3.26	3.76	114,000
June	1,440	480	858	1.50	1.67	51,100
July	710	223	404	0.71	0.82	24,800
August	348	142	214	0.38	0.44	13,200
September	187	117	147	0.26	0.29	8,750
October	223	156	181	0.32	0.37	11,100
November	283	187	229	0.40	0.45	13,600
December	304	180	219	0.38	0.44	13,500
The period	2,620	117	582.4	1.02	11.63	353,050

PHILLIPS CREEK.—(3046).

Location.—Near Roo's ranch, Roosville, a few hundred feet above road.

Records Available.—May to November, 1914, and April to September, 1915.

Drainage Area.—Twenty-three square miles.

Climatic Conditions.—Summers are hot and dry, winters severe, as low as forty degrees below zero, during some cold spells. Light snowfall. Frazil ice may be expected.

Gauge.—A wooden staff read by Mr. Fred Roo.

Channel.—Fairly uniform and smooth. Good control.

Discharge Measurements.—The 1915 curve is based on three measurements in 1914, and four in 1915.

Accuracy.—"B" and "C." The rating curve is satisfactory, and readings also. Results should be within 10 or 15 per cent.

Discharge Measurements of Phillips Creek at Roosville (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 16	Gill	1,048	16.5	23.3	3.36	1.80	78.4
June 17	Gill	1,048	14.0	23.6	4.06	1.85	96.1
July 27	Gill	1,929	11.0	13.3	1.35	1.20	18.0
1915							
April 24	Elliott	1,672	14.0	18.4	2.44	1.50	44.9
May 13	Corbould	1,909	15.0	21.7	2.97	1.60	64.5
June 15	Elliott	1,909	15.0	20.8	2.73	1.55	56.8
Aug. 27	Dempster	1,927	14.0	13.6	1.23	1.20	16.7

Daily Gauge Height and Discharge of Phillips Creek at Roosville for 1915.

(Drainage area, 23 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	1.05	8.3	1.75	76.7	1.70	76.8	1.9	106	1.4	33.3	1.2	17.0
2	1.1	11.6	1.65	63.4	1.7	76.8	1.85	98.6	1.4	33.3	1.2	17.0
3	1.1	11.6	1.6	56.8	1.7	76.8	1.8	91.3	1.35	28.6	1.2	17.0
4	1.1	11.6	1.6	56.8	1.7	76.8	1.75	84.0	1.35	28.6	1.2	17.0
5	1.1	11.6	1.6	56.8	1.7	76.8	1.7	74.5	1.35	28.6	1.2	17.0
6	1.15	14.3	1.55	50.6	1.65	69.9	1.7	74.5	1.35	28.6	1.2	17.0
7	1.1	11.6	1.6	56.8	1.75	84.0	1.65	67.7	1.35	28.6	1.2	17.0
8	1.15	14.3	1.7	69.9	1.65	69.9	1.65	67.7	1.3	24.0	1.2	17.0
9	1.1	11.6	1.7	69.9	1.7	76.8	1.65	67.7	1.3	24.0	1.25	20.5
10	1.15	14.3	1.85	90.2	1.65	69.9	1.6	60.8	1.3	24.0	1.2	17.0
11	1.2	17.0	1.85	92.7	1.6	63.0	1.6	60.8	1.3	24.0	1.2	17.0
12	1.2	17.0	1.8	85.6	1.6	63.0	1.55	54.5	1.3	24.0	1.2	17.0
13	1.5	44.4	1.8	85.6	1.6	63.0	1.6	60.8	1.3	24.0	1.15	14.3
14	1.45	38.8	1.8	85.6	1.55	56.5	1.55	54.5	1.35	28.6	1.2	17.0
15	1.45	38.8	1.75	78.7	1.65	69.9	1.6	60.8	1.25	20.5	1.2	17.0
16	1.5	44.4	1.7	71.9	1.7	76.8	1.6	60.8	1.25	20.5	1.15	14.3
17	1.55	50.6	1.7	71.9	1.7	76.8	1.65	67.7	1.25	20.5	1.15	14.3
18	1.6	56.8	1.65	65.3	1.65	69.9	1.6	60.8	1.25	20.5	1.15	14.3
19	1.7	69.9	1.65	65.3	1.7	76.8	1.6	60.8	1.25	20.5	1.15	14.3
20	1.7	69.9	1.65	67.6	1.65	69.9	1.55	54.5	1.25	20.5	1.15	14.3
21	1.65	63.4	1.65	67.6	1.65	69.9	1.5	46.1	1.25	20.5	1.15	14.3
22	1.6	56.8	1.7	74.5	1.6	63.0	1.5	46.1	1.25	20.5	1.15	14.3
23	1.6	56.8	1.7	74.5	1.6	63.0	1.5	46.1	1.25	20.5	1.15	14.3
24	1.60	56.8	1.7	74.5	1.6	63.0	1.5	46.1	1.25	20.5	1.15	14.3
25	1.55	50.6	1.65	67.6	1.8	91.3	1.45	40.6	1.25	20.5	1.15	14.3
26	1.6	56.8	1.65	67.6	1.95	113.0	1.45	40.6	1.2	17.0	1.15	14.3
27	1.55	50.6	1.6	60.8	1.95	113.0	1.45	40.6	1.2	17.0	1.15	14.3
28	1.55	50.6	1.65	67.6	1.9	106.0	1.45	40.6	1.2	17.0	1.2	17.0
29	1.55	50.6	1.6	63.0	1.9	106.0	1.4	35.1	1.2	17.0	1.2	17.0
30	1.75	76.7	1.6	63.0	1.95	113.0	1.4	35.1	1.2	17.0	1.2	17.0
31	....	....	1.65	69.9	....	....	1.55	52.4	1.2	17.0	....	....

Monthly Discharge of Phillips Creek at Roosville for 1915.

(Drainage area, 23 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	76.7	8.3	37.9	1.64	1.83	2,260
May.	92.7	50.6	70.0	3.04	3.50	4,300
June.	113.0	56.5	78.0	3.40	3.79	4,640
July...	106.0	35.1	59.9	2.60	3.00	3,680
August..	33.3	17.0	22.9	1.00	1.15	1,410
September.	20.5	14.3	15.9	0.69	0.77	946
The period. ...	113.0	8.3	47.4	2.06	14.04	17,236

ROCK CREEK.—(3049).

Location.—½ mile above Rock creek mill, near Elko.

Records Available.—1914 and 1915.

Drainage Area.—Seventy-five square miles.

Climatic Conditions.—Similar to Elko (see Elk river).

Gauge.—A 2-foot wooden staff, read four or five times a week, by Mr. H. B. Stiven, of Elko.

Channel.—Smooth. Swift water. Good control.

Discharge Measurements.—The 1915 data has been prepared from a rating curve based on five well-distributed measurements during the year.

Accuracy.—"C." The results should be within 15 per cent.

Discharge Measurements of Rock Creek at Elko for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1915							
April 25	Elliott	1,672	18.5	25.2	1.79	0.75	45.2
May 14	Corbould	1,909	18.5	30.0	2.15	1.00	65.8
May 30	Elliott	1,672	18.5	30.7	2.17	0.95	67.1
June 14	Elliott	1,909	18.5	25.5	1.82	0.70	46.5
Aug. 27	Dempster	1,927	18.5	17.8	1.15	0.30	20.4

Daily Gauge Height and Discharge of Rock Creek at Elko for 1915.

(Drainage area, 75 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.2	14.7	......	57.9	0.9	59.9	1.0	67.9	0.5	31.8	0.3	19.9
2	0.2	14.7	0.9	59.9	0.95	63.9	0.95	63.9	0.5	31.8	0.3	19.9
3	0.2	14.7	0.95	63.9	0.9	59.9	0.9	59.9	0.45	28.8	0.3	19.9
4	......	14.7	0.95	63.9	0.95	63.9	1.0	67.9	0.45	28.8	0.3	19.9
5	0.2	14.7	0.9	59.9	0.9	59.9	0.95	63.9	0.45	28.8	0.3	19.9
6	......	16.0	0.85	56.0	0.85	56.0	0.9	59.9	0.45	28.8	0.3	19.9
7	0.25	17.3	0.85	56.0	0.85	56.0	0.9	59.9	0.45	28.8	......	19.9
8	0.25	17.3	0.9	59.9	0.8	52.2	0.85	56.0	......	27.2	0.3	19.9
9	......	18.6	......	68.1	0.85	56.0	0.8	52.2	0.4	25.7	......	19.9
10	0.3	19.9	1.1	76.3	0.8	52.2	0.75	48.6	0.4	25.7	0.3	19.9
11	......	21.0	1.15	80.7	......	50.4	0.7	45.0	0.4	25.7	0.3	19.9
12	......	22.1	1.1	76.3	0.75	48.5	0.7	45.0	0.4	25.7	0.3	19.9
13	......	23.2	1.1	76.3	0.75	48.5	0.7	45.0	0.4	25.7	......	21.3
14	......	24.3	1.05	72.0	0.7	45.0	0.65	41.6	0.35	22.8	0.35	22.8
15	......	25.4	1.0	67.9	0.7	45.0	0.65	41.6	0.4	25.7	0.3	19.9
16	......	26.5	0.95	63.9	......	45.3	0.65	41.6	0.4	25.7	0.25	17.3
17	......	27.6	0.9	59.9	0.65	41.6	0.6	38.2	0.35	22.8	0.25	17.3
18	0.45	28.8	0.85	56.0	0.7	45.0	0.65	41.6	0.3	19.9	0.25	17.3
19	0.6	38.2	0.8	52.2	0.65	41.6	0.6	38.2	0.35	22.8	0.25	17.3
20	0.75	48.6	......	52.2	0.65	41.6	0.65	41.6	0.35	22.8	0.25	17.3
21	0.85	56.0	0.8	52.2	0.65	41.6	0.55	35.0	0.35	22.8	......	17.3
22	......	57.9	0.75	48.6	0.65	41.6	0.6	38.2	0.35	22.8	0.25	17.3
23	0.9	59.9	0.8	52.2	0.7	45.0	0.55	35.0	0.3	19.9	0.25	17.3
24	0.9	59.9	0.85	56.0	0.7	45.0	0.6	38.2	0.3	19.9		17.3
25	0.8	52.2	0.9	59.9	0.65	41.6	0.55	35.0	0.3	19.9	0.25	17.3
26	0.75	48.6	0.9	59.9	......	46.9	0.6	38.2	0.3	19.9	0.25	17.3
27	0.7	45.0	0.9	59.9	0.8	52.2	0.65	41.6	0.3	19.9	0.3	19.9
28	0.7	45.0	0.95	63.9	0.95	63.9	0.6	38.2	0.3	19.9		18.6
29	0.8	52.2	0.9	59.9	1.05	72.0	0.55	35.0	0.3	19.9	0.25	17.3
30	0.85	56.0	0.95	63.9	1.1	76.3	0.55	35.0	0.3	19.9	0.25	17.3
31	......	......	0.95	63.9	......	.	0.5	31.8	0.3	19.9		

Monthly Discharge of Rock Creek at Elko for 1915.

(Drainage area, 75 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	59.9	14.7	32.7	0.44	0.49	1,950
May	80.7	48.6	61.9	0.83	0.96	3,810
June	76.3	41.6	51.9	0.69	0.77	3,090
July	67.9	31.8	45.8	0.61	0.70	2,810
August	31.8	19.9	24.2	0.32	0.37	1,490
September	22.8	17.3	18.9	0.25	0.28	1,130
The period	80.7	14.7	39.2	0.52	3.57	14,280

BIG SAND CREEK.—(3042).

Location.—The section is located about 300 yards below the highway bridge, 2 miles from Galloway, near Jaffray.

Records Available.—1914 and 1915.

Drainage Area.—Forty square miles.

Climatic Conditions.—Summers hot and dry, winters severe, with light snowfall.

Gauge.—Vertical staff read daily by Robt. Cameron.

Channel.—Smooth and uniform, with swift water and a good control.

Discharge Measurements.—The 1915 rating curve is based on five measurements in 1914 and five in 1915.

Accuracy.—"A" and "B." The section is suitable for good work, and readings are reliable, results should be within 10 per cent.

Discharge Measurements of Big Sand Creek at Jaffray (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1914							
May 19	Gill	1,048	38.0	93.8	5.44	2.30	511.0
June 19	Gill	1,048	38.0	81.5	4.53	2.00	369.0
July 9	(Prov.) Hicks	....	36.0	51.2	2.64	1.20	135.0
July 29	Gill	1,929	35.0	28.4	1.65	0.65	47.1
Sept. 9	(Prov.) Hicks	....	....	19.9	1.10	0.35	21.9
1915							
April 24	Elliott	1,672	32.0	60.6	3.15	1.40	191.0
May 13	Corbould	1,909	36.0	67.8	4.30	1.65	292.0
June 1	Elliott	1,672	36.0	56.2	3.10	1.35	175.0
June 16	Elliott	1,909	36.0	39.0	2.31	0.97	90.7
Aug. 29	Dempster	1,927	29.0	16.2	0.75	0.18	12.2

Daily Gauge Height and Discharge of Big Sand Creek at Jaffray for 1915.

(Drainage area, 40 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.5	34.0	1.88	332	1.38	180.0	2.18	443.0	0.68	52.8	0.11	10.4
2	0.5	34.0	1.82	312	1.4	185.0	1.93	350.0	0.66	50.0	0.10	10.0
3	0.52	36.0	1.72	279	1.4	185.0	1.68	266.0	0.58	42.0	0.10	10.0
4	1.1	117.0	1.7	272	1.35	172.0	1.68	266.0	0.58	42.0	0.08	9.4
5	1.09	115.0	1.62	247	1.32	165.0	1.58	235.0	0.58	42.0	0.10	10.0
6	1.08	113.0	1.65	256	1.22	142.0	1.46	201.0	0.56	40.0	0.10	10.0
7	1.13	123.0	1.68	266	1.25	148.0	1.4	185.0	0.53	37.0	0.075	9.25
8	1.1	117.0	1.78	298	1.22	142.0	1.23	144.0	0.48	32.4	0.075	9.25
9	0.98	95.8	1.98	368	1.2	137.0	1.13	123.0	0.48	32.4	0.075	9.25
10	1.06	110.0	2.1	412	1.15	127.0	1.03	104.0	0.43	28.4	0.075	9.25
11	1.12	121.0	2.12	420	1.05	108.0	0.98	95.8	0.40	26.0	0.075	9.25
12	1.2	137.0	1.95	357	1.02	103.0	0.98	95.8	0.38	24.6	0.075	9.25
13	1.48	207.0	1.68	266	1.0	99.0	0.93	87.8	0.36	23.2	0.10	10.0
14	1.58	235.0	1.65	256	1.0	99.0	0.95	91.0	0.28	18.0	0.11	10.4
15	1.65	256.0	1.6	241	0.95	91.0	1.13	123.0	0.28	18.0	0.11	10.4
16	1.71	275.0	1.58	235	0.95	91.0	1.33	168.0	0.28	18.0	0.10	10.0
17	1.88	332.0	1.5	212	0.95	91.0	1.28	155.0	0.28	18.0	0.09	9.7
18	2.1	412.0	1.48	207	0.95	91.0	1.18	133.0	0.28	18.0	0.075	9.25
19	2.15	432.0	1.45	198	1.0	99.0	1.16	129.0	0.28	18.0	0.075	9.25
20	2.12	420.0	1.4	185	1.08	113.0	1.08	113.0	0.28	18.0	0.075	9.25
21	2.08	405.0	1.35	172	1.05	108.0	0.98	95.8	0.28	18.0	0.075	9.25
22	1.95	357.0	1.45	198	1.0	99.0	0.96	93.0	0.26	17.0	0.075	9.25
23	1.75	288.0	1.5	212	0.98	95.8	0.88	80.0	0.25	17.0	0.09	9.7
24	1.48	207.0	1.48	207	0.85	91.0	0.86	77.0	0.23	15.5	0.18	13.2
25	1.45	198.0	1.45	198	1.08	113.0	0.78	65.4	0.23	15.5	0.15	12.0
26	1.45	198.0	1.42	190	2.48	568.0	0.78	65.4	0.22	15.0	0.14	11.6
27	1.48	207.0	1.4	185	3.5	1190.0	0.78	65.4	0.22	15.0	0.12	10.8
28	1.52	218.0	1.48	207	2.75	689.0	0.78	65.4	0.23	15.5	0.10	10.0
29	1.58	235.0	1.58	235	2.3	492.0	0.78	65.4	0.15	12.0	0.10	10.0
30	1.82	312.0	1.48	207	2.35	513.0	0.73	58.9	0.14	11.6	0.10	10.0
31	....	....	1.4	185	....	....	0.68	52.8	0.12	11.2	....	....

Monthly Discharge of Big Sand Creek at Jaffray for 1915.

(Drainage area, 40 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	432.0	34.00	212.00	5.30	5.91	12,600
May	420.0	172.00	252.00	6.30	7.26	15,500
June	1,190.0	91.00	218.00	5.45	6.08	13,000
July	443.0	52.80	138.00	3.45	3.98	8,480
August	52.8	11.20	24.60	0.61	0.70	1,510
September	13.2	9.25	9.98	0.25	0.28	594
The period	1,190.0	9.25	142.43	3.56	24.21	51,684

Little Sand Creek.—(3043).

Location.—The section is located at the small traffic bridge, above Rosen's ranch, near Jaffray.

Records Available.—1914 and 1915.

Drainage Area.—Thirty-three square miles.

Climatic Conditions.—Summers hot and dry, winters severe, with light snowfall.

Gauge.—Vertical staff, nailed to bridge abutment, and read by Mr. A. Rosen.

Channel.—Uniform. Water unbroken and swift. Control is fair.

Discharge Measurements.—The 1915 data is based on a rating curve prepared from two measurements in 1914, and five in 1915.

Accuracy.—"C." Results are thought to be within 15 per cent.

Discharge Measurements of Little Sand Creek at Jaffray (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
1914			Feet.	Sq. ft.	Ft. per sec.	Inches.	Sec.-ft.
June 19	Gill	1,048	24.0	26.7	3.01	12	80.3
July 29	Gill	1,929	24.0	14.7	2.04	5½	30.0
1915							
April 24	Elliott	1,672	24.0	17.6	2.11	7	37.2
May 13	Corbould	1,909	24.0	29.4	3.44	13	101.0
June 1	Elliott	1,672	24.0	18.9	2.24	7	42.4
June 16	Elliott	1,909	24.0	18.7	2.24	7½	42.1
Aug. 29	Dempster	1,927	23.5	14.3	1.92	5	27.3

Daily Gauge Height and Discharge of Little Sand Creek at Jaffray for 1915.
(Drainage area, 33 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.	Inches.	Sec.-ft.
1	3.0	19.4	9.0	54.3	7.2	39.9	10.0	64.2	7.8	44.3	4.5	25.0
2	3.0	19.4	7.5	42.1	7.2	39.9	9.0	55.3	7.5	42.1	4.5	25.0
3	4.0	23.0	7.8	44.3	6.8	37.3	9.25	56.8	7.2	39.9	4.0	23.0
4	4.5	25.0	7.5	42.1	6.5	35.4	9.0	54.3	6.5	35.4	4.0	23.0
5	4.5	25.0	8.0	45.7	7.0	38.5	8.5	59.9	6.0	32.4	4.0	23.0
6	5.2	28.3	8.0	45.7	8.0	45.7	8.0	45.7	6.0	32.4	4.0	23.0
7	5.5	29.8	8.0	45.7	8.2	47.4	8.0	45.7	6.0	32.4	4.0	23.0
8	5.0	27.3	8.5	49.9	8.5	49.9	8.5	49.9	5.75	30.9	4.0	23.0
9	8.2	47.4	11.0	75.4	9.8	62.2	8.5	49.9	5.5	29.8	4.75	26.2
10	8.2	47.4	10.5	69.8	8.2	47.4	8.25	47.8	5.0	27.3	7.25	40.3
11	5.6	30.2	11.8	85.2	8.0	45.7	7.5	42.1	5.0	27.3	8.25	47.8
12	4.5	25.0	12 5	94.4	7.8	44.3	7.5	42.1	5.0	27.3	8.0	45.7
13	4.0	23.0	12.5	94.4	7.5	42.1	7.75	43.9	4.5	25.0	7.5	42.1
14	4.0	23.0	12.2	90.4	7.0	38.5	8.0	45.7	4.75	26.2	7.25	40.3
15	3 8	22.3	12.8	98.3	7.2	39.9	8.25	47.8	5.0	27.3	5.75	30.9
16	4.2	23.8	9.2	56.3	7.2	39.9	8.75	52.0	5.0	27.3	5.25	28.6
17	6.8	37.3	8.2	47.4	7.0	38.5	8.75	52.0	5.0	27.3	4.5	25.0
18	7.5	42.1	8.5	49.9	7.5	42.1	8.5	49.9	5.0	27.3	4.0	23.0
19	6.2	33.6	7.8	44.3	7.0	38.5	12.5	94.4	5.0	27.3	4.0	23.0
20	7.5	42.1	7.5	42.1	7.0	38.5	8.5	49.9	5.0	27.3	4.0	23.0
21	7.2	39.9	8.0	45.7	7 0	38.5	12.8	98.3	4.5	25.0	4.0	23.0
22	7.8	44.3	9.0	54.3	7.0	38.5	12.8	98.3	4.5	25.0	4.0	23.0
23	11 2	77.9	9.5	59.3	7.0	38.5	13.2	104.0	9.25	56.8	4.0	23.0
24	8.0	45.7	11 2	77.9	7.0	38.5	12.5	94.4	5.0	27.3	4.0	23.0
25	11.5	81.6	11.0	75.5	7.2	39.9	8.2	47.4	5.0	27.3	4.0	23.0
26	7.8	44.3	10.0	64.2	13.2	104.0	8.0	45.7	5.0	27.3	4.0	23.0
27	7.0	38.5	9.2	56.3	14.8	127.0	10.5	69.8	5.0	27.3	4.0	23.0
28	7.5	42.1	8.2	47.4	12.2	90.4	8.5	49.9	5.0	27.3	4.0	23.0
29	7.5	42.1	7.2	39.9	11.0	75.4	8.0	45.7	4.75	26.2	3.75	22.1
30	8.5	49.9	6.5	35.4	10.2	66.4	7.5	42.1	5.0	27.3	3.75	22.1
31	....	....	6.8	37 3	....	....	7.5	42.1	4.75	26.2	....	....

Monthly Discharge of Little Sand Creek at Jaffray for 1915.

(Drainage area, 33 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	81.6	19.4	36.7	1.11	1.24	2,180
May	98.3	35.4	58.4	1.80	2.08	2,590
June	127.0	35.4	50.3	1.52	1.70	2,990
July	104.0	42.1	57.3	1.74	2.01	3,520
August	56.8	25.0	30.3	0.92	1.06	1,860
September	47.8	22.1	27.1	0.82	0.92	1,610
The period	127.0	19.4	43.3	1.32	9.01	14,750

ST. MARY'S RIVER.—(3050).

Location.—At traffic bridge, near Wycliffe, 12 miles from the mouth, and 7 miles from Cranbrook.

Records Available.—1914 and 1915.

Drainage Area.—One thousand one hundred square miles.

Climatic Conditions.—The climatic conditions near Wycliffe are similar to those at Cranbrook. Summers hot, with dry winds, winters severe, with occasional cold spells, during which it may reach forty degrees below zero. Precipitation is light. Frazil ice is to be expected.

Gauge.—A vertical staff gauge read daily by the Otis Staples Lumber Company till the end of September.

Channel.—Straight, uniform, with smooth swift flow. Good control.

Discharge Measurements.—The 1915 rating curve is based on six measurements made by the Provincial Water Rights Branch, in 1912 and 1913, four measurements made by this survey in 1914, and three in 1915.

Accuracy.—"B" and "C." Results should be within 10 or 15 per cent.

Discharge Measurements of St. Mary's River at Wycliffe (For Curve).

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
1912							
Aug. 21	(Prov.) Hicks		150	477	1.81	2.05	862
Dec. 2	(Prov.) Hicks		125	345	1.36	1.10	468
1913							
June 14	(Prov.) Hicks		175	1,290	8.33	6.80	10,800
June 25	(Prov.) Roblin		175	1,070	5.88	5.50	6,270
July 21	(Prov.) Hicks		168	786	3.80	3.90	2,990
Sept. 17	(Prov.) Roblin		151	450	1.86	1.80	838
1914							
June 30	Gill	1,048	143	1,110	6.82	5.90	7,560
July 23	Gill	1,929	162	708	3.46	3.60	2,450
Oct. 10	Gill	1,929	148	454	1.93	1.90	878
Oct. 16	Gill	1,929	148	452	1.94	1.90	877
1915							
Feb. 21	Elliott & Corbould	1,909	130	493	1.32	Ice	651[1]
May 27	Elliott	1,672	222	665	5.85	4.60	3,890
June 12	Elliott	1,909	237	570	5.10	4.00	2,910

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[1] Ice conditions.

Daily Gauge Height and Discharge of St. Mary's River at Wycliffe for 1915.

(Drainage area, 1,100 square miles.)

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.8	1,590	4.85	4,680	4.65	4,230	4.4	3,710	3.0	1,780	2.15	1,030
2	3.0	1,780	4.72	4,380	4.55	4,020	4.1	3,170	3.0	1,780	2.1	990
3	2.7	1,500	4.52	3,950	4.5	3,910	4.2	3,340	3.0	1,780	2.1	990
4	2.8	1,590	4.32	3,560	4.6	4,120	4.5	3,910	3.0	1,780	2.1	990
5	2.9	1,680	4.02	3,040	4.7	4,340	4.4	3,710	2.8	1,580	2.1	990
6	3.2	2,000	4.0	3,010	4.85	4,680	4.0	3,010	2.6	1,400	2.1	990
7	3.0	1,780	4.12	3,200	4.9	4,790	3.6	2,460	2.5	1,310	2.1	990
8	2.7	1,500	4.92	4,840	5.3	5,800	3.2	2,000	2.5	1,310	2.1	990
9	2.6	1,400	5.3	5,800	4.9	4,790	3.5	2,340	2.5	1,310	2.1	990
10	2.5	1,310	5.45	6,210	4.55	4,020	3.3	2,110	2.55	1,360	2.1	990
11	2.45	1,270	5.3	5,800	4.05	3,090	3.45	2,280	2.5	1,310	2.1	990
12	2.5	1,310	4.9	4,790	4.1	3,170	3.55	2,400	2.55	1,360	2.1	990
13	3.0	1,780	4.35	3,620	4.1	3,170	3.3	2,210	2.5	1,310	2.05	950
14	3.1	1,890	4.45	3,810	4.0	3,010	3.5	2,340	2.55	1,360	2.0	910
15	3.1	1,890	4.75	4,450	4.05	3,090	3.5	2,340	2.5	1,310	2.0	910
16	3.1	1,890	4.4	3,710	4.1	3,170	3.8	2,720	2.5	1,310	2.0	910
17	3.55	2,400	4.2	3,340	4.55	4,020	4.05	3,090	2.5	1,310	1.9	836
18	4.3	3,520	4.1	3,170	4.5	3,910	3.8	2,720	2.5	1,310	1.9	836
19	4.75	4,450	4.25	3,430	4.2	3,340	3.95	2,940	2.5	1,310	1.9	836
20	4.9	4,790	4.1	3,170	4.25	3,430	3.8	2,720	2.55	1,360	1.9	836
21	4.45	3,810	4.1	3,170	4.15	3,260	3.7	2,590	2.5	1,310	1.9	836
22	4.25	3,430	4.2	3,340	3.95	2,940	3.5	2,340	2.5	1,310	1.9	836
23	4.1	3,170	4.35	3,620	4.0	3,010	3.5	2,340	2.5	1,310	1.9	836
24	4.02	3,040	4.4	3,710	3.95	2,940	3.55	2,400	2.5	1,310	1.95	873
25	3.55	2,400	4.4	3,710	4.15	3,260	3.6	2,460	2.5	1,310	2.1	990
26	3.4	2,220	4.35	3,620	4.45	3,810	3.4	2,220	2.4	1,230	2.25	1,110
27	3.4	2,220	4.45	3,810	4.4	3,710	3.4	2,220	2.35	1,190	2.35	1,190
28	3.6	2,460	4.7	4,340	4.55	4,020	4.0	3,010	2.35	1,190	2.45	1,270
29	3.65	2,520	4.45	3,810	4.4	3,710	3.75	2,660	2.4	1,230	2.4	1,230
30	4.2	3,340	4.55	4,020	4.3	3,520	3.55	2,400	2.35	1,190	2.4	1,230
31	....	....	4.55	4,020	....	....	3.25	2,060	2.3	1,150	....	....

Monthly Discharge of St. Mary's River at Wycliffe for 1915.

(Drainage area, 1,100 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
April	4,790	1,270	2,330	2.12	2.36	139,000
May	6,210	3,010	3,970	3.61	4.16	244,000
June	5,800	2,940	3,740	3.40	3.79	223,000
July	3,910	2,000	2,520	2.29	2.64	155,000
August	1,780	1,150	1,370	1.25	1.44	84,200
September	1,270	836	978	0.89	0.99	60,100
The period	6,210	836	2,484	2.26	15.38	905,300

MISCELLANEOUS METERINGS—NELSON DIVISION.

NELSON DISTRICT.

Date.	Stream.	Tributary To—	Locality.	Gauge Height.	Discharge.	Drainage Area.	Discharge per square mile.
				Feet.	Sec.-ft.	Sq. miles	Sec.-ft.
1915							
May 29	Eagle creek	Arrow lakes	Near Edgewood		209.0		
June 24	Eagle creek	Arrow lakes	Near Edgewood		47.3		
Sept. 16	Eagle creek	Arrow lakes	Near Edgewood		5.61		
Oct. 21	Eagle creek	Arrow lakes	Near Edgewood		3.79		
July 12	Giveout creek	Cottonwood creek	Near Nelson		25.2		
July 27	Hall creek	Salmon river	Near Halls siding		44.2		
Oct. 22	Hall creek	Salmon river	Near Halls siding		8.1		
Oct. 23	Whatshan creek	Arrow lakes	Near Needles				
	(Above Barnes creek)				103.0		
	(Below Barnes creek)				142.0		
April 8	Cariboo creek	Arrow lakes	Near Burton City		370.0		
May 18	Cariboo creek	Arrow lakes	Near Burton City		933.0		
May 28	Cariboo creek	Arrow lakes	Near Burton City		1,500.0		
Sept. 15	Cariboo creek	Arrow lakes	Near Burton City		183.0		
Mar. 17	Carpenter creek		Near New Denver		96.0		
April 27	Carpenter creek		Near New Denver		450.0		
June 10	Carpenter creek		Near New Denver		361.0		
Sept. 8	Carpenter creek		Near New Denver		170.0		
Dec. 3	Carpenter creek		Near New Denver		103.0		
1914							
Nov. 28	Lardeau river	Duncan river	Near Howser		1,130.0		
1915							
Mar. 5	Lardeau river	Duncan river	Near Howser		484.0		
May 6	Lardeau river	Duncan river	Near Howser		3,520.0		
July 22	Lardeau river	Duncan river	Near Howser		4,540.0		
Oct. 28	Lardeau river	Duncan river	Near Howser		1,320.0		
Mar. 17	Slocan river	Kootenay river	Near Slocan City		460.0		
July 29	Slocan river	Kootenay river	Near Slocan City		2,930.0		
Mar. 17	Wilson creek	Slocan lake	Near Roseberry		187.0		
April 29	Wilson creek	Slocan lake	Near Roseberry		1,350.0		
June 9	Wilson creek	Slocan lake	Near Roseberry		1,250.0		
Sept. 10	Wilson creek	Slocan lake	Near Roseberry		293.0		
Dec. 2	Wilson creek	Slocan lake	Near Roseberry		360.0		

REVELSTOKE DISTRICT.

Feb. 26	Horsethief creek	Columbia river	Near Wilmer		67.6		
Sept. 23	Horsethief creek	Columbia river	Near Wilmer		289.0		
Mar. 16	Illecillewaet river	Columbia river	Near Glacier		9.9		
May 12	Illecillewaet river	Columbia river	Near Glacier		120.0		
Oct. 19	Illecillewaet river	Columbia river	Near Glacier		34.4		
1914							
Nov. 20	Salmon river	Arrow lakes	Near Beaton		56.9		
1915							
Mar. 19	Salmon river	Arrow lakes	Near Beaton		31.8		
May 16	Salmon river	Arrow lakes	Near Beaton		171.0		
Sept. 13	Salmon river	Arrow lakes	Near Beaton		84.0		
Oct. 26	Salmon river	Arrow lakes	Near Beaton		41.1		
April 30	Shuswap creek	Columbia river	Near Athalmer		28.4		
May 24	Shuswap creek	Columbia river	Near Athalmer		25.7		
July 9	Shuswap creek	Columbia river	Near Athalmer		35.5		
Sept. 21	Shuswap creek	Columbia river	Near Athalmer		11.4		
April 30	Stoddart creek	Columbia river	Near Athalmer		4.46		
May 24	Stoddart creek	Columbia river	Near Athalmer		5.42		
July 9	Stoddart creek	Columbia river	Near Athalmer		8.38		
Sept. 21	Stoddart creek	Columbia river	Near Athalmer		3.96		
Feb. 27	Sinclair creek	Columbia river	Near Radium Hot Springs		11.5		
May 2	Sinclair creek	Columbia river	Near Radium Hot Springs		66.8		
May 22	Sinclair creek	Columbia river	Near Radium Hot Springs		63.8		
June 9	Sinclair creek	Columbia river	Near Radium Hot Springs		80.0		
July 9	Sinclair creek	Columbia river	Near Radium Hot Springs		80.9		
Sept. 21	Sinclair creek	Columbia river	Near Radium Hot Springs		29.8		
April 29	Windermere creek	Columbia river	Near Windermere		13.7		
May 24	Windermere creek	Columbia river	Near Windermere		17.9		
June 11	Windermere creek	Columbia river	Near Windermere		18.6		
July 7	Windermere creek	Columbia river	Near Windermere		26.8		
Sept. 22	Windermere creek	Columbia river	Near Windermere		20.9		

CRANBROOK DISTRICT.

Mar. 11	Cedar creek	Kootenay lake	Near Ainsworth		1.34		
May 11	Hammill creek	Kootenay lake	Near Argenta		626.0		
July 23	Hammill creek	Kootenay lake	Near Argenta		947.0		
Oct. 29	Hammill creek	Kootenay lake	Near Argenta		203.0		
Mar. 10	Woodbury creek	Kootenay lake	Near Ainsworth		48.0		

REPORT

OF THE

BRITISH COLUMBIA HYDROMETRIC SURVEY FOR 1915.

CHAPTER IX.

Fort George District—Hydrometric Data.

CHAPTER IX.

FORT GEORGE DISTRICT.

HYDROMETRIC DATA.

Bulkley River.

Bulkley river is one of the largest tributaries of the Skeena. It rises on the western slope of the interior plateau and flows in a north-westerly direction to join the Skeena, near Hazelton. The Bulkley is about 150 miles in length and drains an area of about 3,900 square miles.

The Bulkley is a rough, unnavigable stream and flows through many rapids and canyons. For 30 miles above its mouth it flows through a deep and narrow canyon, falling 1,000 feet in this distance. The valley enclosing Bulkley river is very large, varying from four to ten miles in width. On the south-west, from Hazelton to Moricetown, this valley is flanked by the rugged Rocher Deboules mountains, and from Moricetown to Barrett, by Hudson Bay mountains. On the north-east the mountains are lower and not as rugged.

There are no power developments as yet, but the Bulkley canyon affords probably one of the best power possibilities in northern British Columbia.

The principal tributaries of the Bulkley are, the Morice and Telkwa rivers, Bull, Boulder, Porphyry and Mud creeks on the south; Canyon and Driftwood creeks and Suskwa river on the north.

There are at present two gauging stations on the Bulkley river. One is at Hubert, above the mouth of the Telkwa river, the other is at Hazelton at the mouth. This latter station is to give the flow through the Bulkley canyon. The gauging station at Hubert was established in July, 1915, and records are available from then till December 31. Measurements are made from the downstream side of the highway bridge. A vertical staff gauge is nailed to the pier, at the south end of the bridge.

The metering station at Hazelton is at the ferry crossing about half a mile from the mouth. Daily gauge readings have been taken since July, 1915, on a chain gauge at the low level suspension bridge, 2 miles above the metering station. Meter measurements are made from the Government pontoon ferry, a tag line is stretched from shore to shore to mark points of observation, the ferry being held in place by the current action on the face of the pontoons.

High level suspension bridge, 250 feet above Bulkley river, near New Hazelton.

Old Indian bridge in background.

Kettle river, at Cascade.

The drop in this canyon is utilized by the Cascade power plant of the West Kootenay Power and Light Co. Total head, 156 feet.

—Photograph by Lake Studio, Grand Forks.

BULKLEY RIVER, HAZELTON.—(4004).

Location.—At ferry crossing, about ¼ mile above confluence with Skeena river, ¾ of a mile from Old Hazelton.

Records Available.—Gauge heights from July 13 to December 31, 1915. Insufficient data to compute daily discharges.

Drainage Area.—Approximately 3,900 square miles.

Gauge.—Chain gauge at low level suspension bridge, over Bulkley canyon, 2 miles above metering section. Daily readings by Mr. A. M. Ruddy.

Channel.—One channel at all stages. Straight above and below section. The stream bed appears to be permanent. The depth of water at the section is influenced at some stages by backwater from the Skeena river.

Discharge Measurements.—Four measurements in open season and one in early winter.

Winter Flow.—The river freezes over early in December. Frazil and anchor ice remain in the river for most of the winter.

Discharge Measurements of Bulkley River near Hazelton, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 14	Chisholm & Challies	1,521	460	1,890	6.11	18.42	11,580
Aug. 27	Elliott & Challies	1,521	473	1,460	5.59	13.5	8,160
Sept. 25	J. A. Elliott	1,521	470	1,210	4.47	11.0	5,410
Oct. 22	J. A. Elliott	1,521	470	1,304	4.80	11.2	6,260

BULKLEY RIVER, HUBERT.—(4003).

Location.—At highway bridge, near Hubert, and about 3 miles above the mouth of Telkwa river.

Records Available.—July 8 to December 31, 1915.

Drainage Area.—Approximately 2,070 square miles.

Gauge.—Vertical staff gauge, nailed on upstream side of pier at south end of bridge. Daily readings by Mrs. F. Norris.

Channel.—Divided into three sections by bridge piers. Straight above and below for 250 feet. Section is influenced by a curve in the channel about 300 feet above the bridge.

Discharge Measurements.—Four measurements during the open season of 1915.

Winter Flow.—The river freezes over about the end of November. Ice jams, frazil and anchor ice affect the winter flow.

Accuracy.—"C" and "D." For gauge heights above 2.5 feet results should be within 15%. Below 2.5 feet results are probably within 20%.

Discharge Measurements of Bulkley River near Hubert, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 8	K. G. Chisholm	1,521	310	1,450	5.11	4.80	7,420
Aug. 30	Elliott & Challies	1,521	294	1,130	4.31	3.87	4,880
Sept. 27	J. A. Elliott	1,521	290	835	3.69	2.95	3,080
Oct. 25	J. A. Elliott	1,521	290	790	3.78	2.75	2,980[1]

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[1] Snowing.

Daily Gauge Height and Discharge of Bulkley River near Hubert for 1915.

(Drainage area, 2,070 square miles.)

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	......	....	4.9	7,740	3.8	4,770	3.0	3,150	2.7	2,700	1.6	1,350
2	......	....	4.9	7,740	3.8	4,770	3.0	3,150	2.6	2,550	1.6	1,350
3	......	....	4.9	7,740	3.8	4,770	3.0	3,150	2.6	2,550	1.6	1,350
4	......	....	4.9	7,740	3.8	4,770	3.0	3,150	2.6	2,550	1.6	1,350
5	......	....	4.9	7,740	3.8	4,770	3.0	3,150	2.6	2,550	1.5	1,250
6	......	....	4.9	7,740	3.8	4,770	2.9	3,000	2.5	2,400	1.5	1,250
7	......	....	4.9	7,740	3.8	4,770	2.9	3,000	2.5	2,400	1.4	1,160
8	......	....	4.8	7,440	3.7	4,540	2.9	3,000	2.4	2,270	1.4	1,160
9	4.8	7,440	4.8	7,440	3.7	4,540	2.9	3,000	2.3	2,140	1.2	980
10	4.9	7,740	4.7	7,140	3.6	4,320	2.9	3,000	2.3	2,140	1.2	980
11	4.9	7,740	4.5	6,540	3.5	4,100	2.8	2,850	2.3	2,140	1.2	980
12	5.2	8,640	4.5	6,540	3.5	4,100	2.8	2,850	2.2	2,010	1.2	980
13	5.2	8,640	4.5	6,540	3.4	3,900	2.7	2,700	2.1	1,890	1.2	980
14	5.0	8,040	4.5	6,540	3.3	3,700	2.6	2,550	2.0	1,770	1.2	980
15	4.8	7,440	4.3	6,000	3.3	3,700	2.6	2,550	2.0	1,770	1.2	980
16	4.8	7,440	4.3	6,000	3.4	3,900	2.5	2,400	2.0	1,770	1.2	980
17	5.0	8,040	4.2	5,730	3.4	3,900	2.6	2,550	2.0	1,770	1.2	980
18	5.0	8,040	4.2	5,730	3.4	3,900	2.5	2,400	2.0	1,770	1.2	980
19	5.0	8,040	4.2	5,730	3.4	3,900	2.7	2,700	2.0	1,770	1.2	980
20	5.0	8,040	4.2	5,730	3.3	3,700	2.8	2,850	2.0	1,770	1.2	980
21	5.0	8,040	4.1	5,480	3.3	3,700	2.8	2,850	1.9	1,650	1.2	980
22	5.0	8,040	4.1	5,480	3.1	3,320	2.9	3,000	1.9	1,650	1.2	980
23	5.1	8,340	4.1	5,480	3.1	3,320	2.8	2,850	1.8	1,550	1.2	980
24	5.1	8,340	4.1	5,480	3.1	3,320	2.8	2,850	1.8	1,550	1.2	980
25	5.0	8,040	4.1	5,480	3.1	3,320	2.8	2,850	1.8	1,550	1.2	980
26	5.0	8,040	4.1	5,480	3.1	3,320	2.8	2,850	1.7	1,450	1.2	980
27	4.9	7,740	4.1	5,480	3.1	3,320	2.7	2,700	1.6	1,350	1.2	980
28	4.9	7,740	4.0	5,230	3.0	3,150	2.7	2,700	1.6	1,350	1.2	980
29	4.9	7,740	3.9	5,000	3.0	3,150	2.8	2,850	1.6	1,350	1.2	980
30	4.9	7,740	3.9	5,000	3.0	3,150	2.8	2,850	1.6	1,350	1.2	980
31	4.9	7,740	3.8	4,770	....	....	2.7	2,700	....	....	1.2	980

Monthly Discharge of Bulkley River near Hubert for 1915.

(Drainage area, 2,070 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
August	7,740	4,770	6,310	3.04	3.50	388,000
September	4,770	3,150	3,960	1.91	2.13	236,000
October	3,150	2,700	2,850	1.38	1.59	175,000
November	2,700	1,350	1,920	0.93	1.04	114,000
December	1,350	980	1,060	0.51	0.59	65,200
The period	7,740	980	3,220	1.55	8.85	978,200

DORE RIVER.

The Dore or Fifty Mile river rises in the Cariboo mountains, about 25 miles south-west of the town of McBride, and flows north to the Fraser river. The town of McBride is about 2½ miles east of the mouth of the Dore. Dore river has a fairly steep gradient and several small power sites. It will probably afford a water or power supply for McBride, as it is the most important stream in this vicinity.

DORE RIVER.—(4002).

Location.—About ½ mile above the confluence with the Fraser river, and below all tributaries. The station is on the Grand Trunk Pacific Railway bridge, about 2½ miles west of McBride, B.C.

Records Available.—July 2 to November 25, 1915.

Drainage Area.—Approximately 190 square miles.

Gauge.—Chain gauge fastened to a supported rod on the right bank, about 100 yards above the railway bridge. Gauge is read two or three times a week, by Miss M. Johnson, of McBride.

Channel.—The channel is straight above and below the section for 50 yards. The river bed is liable to shift. One channel at all stages.

Discharge Measurements.—Three well-distributed measurements in 1915, and one ice measurement in winter.

Winter Flow.—The river freezes over in November, and does not appear to carry frazil ice or anchor ice.

Accuracy.—"D." The gauge readings are infrequent, and the station newly established. Results should be within 20%.

Discharge Measurements of Dore River near McBride, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 2	K. G. Chisholm	1,521	120	350	4.69	4.63	1,660
Aug. 21	Elliott & Challies	1,521	110	306	4.39	4.10	1,340[1]
Sept. 19	J. A. Elliott	1,521	108	264	4.69	3.90	1,240

[1] Shift in channel.

Daily Gauge Height and Discharge of Dore River near McBride, B.C., for 1915.

(Drainage area, 190 square miles.)

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	5.2	2,000	....	1,650	....	550	....	500	....	....
2	....	....	....	1,900	....	1,500	2.7	560	....	440	....	....
3	....	....	....	1,800	4.1	1,350	....	520	2.44	390	....	....
4	4.4	1,520	4.7	1,700	....	1,400	....	480	....	360	....	....
5	....	1,620	....	1,780	....	1,460	....	440	....	330	....	....
6	....	1,720	....	1,850	....	1,520	2.4	390	....	300	....	....
7	4.9	1,820	....	1,920	....	1,580	....	390	2.45	270	....	....
8	....	1,720	5.2	2,000	4.6	1,640	....	400	....	240	....	....
9	....	1,520	....	1,940	....	1,330	....	410	....	200	....	....
10	....	1,320	....	1,880	....	1,020	2.45	415	2.25	160	....	....
11	3.7	1,120	4.9	1,820	....	700	....	410	....	160	....	....
12	....	1,220	....	1,880	2.4	390	....	400	....	160	....	....
13	....	1,370	....	1,940	....	350	2.4	390	....	160	....	....
14	4.4	1,520	....	2,000	2.9	670	....	480	2.4	160	....	....
15	....	1,520	5.3	2,060	....	670	....	560	....	160	....	....
16	....	1,520	....	2,060	2.9	670	....	650	....	160	....	....
17	....	1,520	....	2,060	....	950	3.0	730	2.55	160	....	....
18	4.4	1,520	5.3	2,060	3.9	1,240	....	680	....	150	....	....
19	....	1,620	....	1,830	2.9	670	....	620	....	140	....	....
20	....	1,670	....	1,600	....	620	2.7	560	....	130	....	....
21	....	1,720	4.1	1,350	....	560	....	560	2.5	120	....	....
22	4.9	1,820	....	1,530	2.6	500	....	560	....	110	....	....
23	....	1,720	....	1,710	....	480	....	560	....	110	....	....
24	....	1,720	....	1,900	....	460	2.7	560	2.7	110	....	....
25	4.6	1,640	5.3	2,060	2.5	440	....	580	....	100	....	....
26	....	1,680	....	2,080	....	460	....	600	....	Frozen	....	....
27	....	1,720	....	2,100	....	480	2.8	610	....	....	....	....
28	4.8	1,760	....	2,100	....	500	....	600	....	....	....	....
29	....	1,840	5.4	2,120	2.65	530	....	580	....	....	....	....
30	....	1,920	....	1,970	....	540	....	580	....	....	....	....
31	....	....	....	1,820	....	....	2.7	560	....	....	....	....

Monthly Discharge of Dore River near McBride, B.C., for 1915.

(Drainage area, 190 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
August	2,120	1,350	1,900	10.0	11.5	117,000
September	1,650	440	880	4.62	5.16	52,400
October	730	390	530	2.79	3.22	32,600
The period	2,120	390	1,103	5.80	19.88	202,000

NECHAKO RIVER.

The Nechako river rises at the western end of the lake region of the great interior plateau, south of the Grand Trunk Pacific. The Nechako has its source in Ootsabunket and Cheslatta lakes, at an elevation of about 2,900 feet, and, after flowing about 70 miles in a north-easterly direction, almost touches the eastern end of Fraser lake, and then turns nearly due east along the 54th parallel, holding this direction for 100 miles to its confluence with the Fraser at Fort George. Near Fraser lake the Upper Nechako receives the waters from Fraser and François lakes.

Nechako river may be said to be of three main branches:—the Upper Nechako, which drains Ootsabunkut, Cheslatta, Natalkuz, Euchu, and Tetachuck lakes; the Nautley and Endako rivers which drain François and Fraser lakes; and the Stuart which drains Tacla, Tremblay and Stuart lakes. The drainage area of the Nechako basin is about 15,700 square miles.

The Nechako valley proper is in reality an old lake bed and its soil is very rich. It averages 15 miles in width and contains several thousand acres of excellent farming land.

The lower Nechako was navigated by small river steamers, from Fort George to Fort Fraser, during the construction of the Grand Trunk Pacific Railway. As early as 1871, a 70-foot steamer, the "Enterprise," made a trip from Soda creek to Tacla lake, during the Omineca gold rush. The remains of this steamer are now beached on Tremblay lake. During the summer of 1915 the Department of Public Works, Canada, did considerable improvement work on the Stuart river rapids to make a navigable waterway at all stages from the railway to the Omineca mining region.

There are no power developments on the Nechako at present. The total fall between Ootsabunkut, or Ootsa lake, and the Fraser is about 860 feet, of which 80 feet is in the short stretch between Ootsa and Natalkuz lakes. Near the Cheslatta Creek rapids, about 60 miles up the Upper Nechako, there is a box canyon 12 miles long, which contains many falls and rapids.

Several of the largest lakes in the province are in the Nechako basin,—Ootsa, 140 miles long; Cheslatta, 25 miles; Francois, 60 miles; and Fraser, 14 miles; Stuart (area, 221 square miles); and Tacla, 135 square miles.

There are two gauging stations being maintained on the Nechako river at the present time, one at Vanderhoof, on the Lower Nechako, and one near Fort Fraser, on the Upper Nechako. The gauging station on the Upper Nechako river was established in June, 1915, and daily gauge readings have been taken since that time. Meterings are made from the railway bridge, half a mile west of Fort Fraser. The gauging station on the Lower Nechako, at Vanderhoof, was established in June, 1915. Daily gauge readings are taken and meterings are made from a boat station near the ferry crossing of the Vanderhoof-Stuart lake road. This latter station gives the combined discharges of the Upper Nechako, Nautley and Endako rivers.

Climatic conditions in the Nechako valley are shown by the temperature and precipitation tables for Fort St. James and Fort George. The winter is generally of 5 months duration, snow coming to stay in mid-November and lasting until the middle of April. The precipitation is light but well distributed throughout the year.

NECHAKO RIVER, FORT FRASER.—(4000).

Location.—At the Grand Trunk Pacific Railway bridge, about ½ mile west of Fort Fraser townsite.

Records Available.—June 16 to December 10, 1915.

Drainage Area.—Approximately 6,150 square miles.

Gauge.—Vertical staff gauge, nailed to a timber pile on the left bank of the river, about 75 feet above the railway bridge. The gauge is read daily in the open season and semi-weekly in the frozen season, by Mr. F. Clarke.

Channel.—Straight above and below section. Divided into sections by the bridge piers. There is a possibility of shift in the section, due to current action around the piers of the bridge.

Discharge Measurements.—Four well-distributed measurements during the summer of 1915.

Winter Flow.—The river freezes in mid-November, and is frozen until the middle of April. During the early winter months the flow is affected by presence of anchor and frazil ice.

Accuracy.—"C." The station is newly established, but the conditions for metering are good. The results should be well within 15%.

Discharge Measurements of Nechako River near Fort Fraser, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
June 17	K. G. Chisholm	1,521	490	6,210	2.37	8.64	14,730
July 18	Chisholm & Challies	1,521	480	5,480	2.18	7.10	11,920
Aug. 26	Elliott & Challies	1,521	470	3,950	1.67	4.20	6,610
Sept. 23	Elliott & Challies	1,521	430	3,180	1.40	2.68	4,440

Daily Gauge Height and Discharge of Nechako River near Fort Fraser, B.C., for 1915.

(Drainage area, 6,150 square miles.)

Day.	June.		July.		August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	......	7.8	13,100	6.45	10,450	3.9	6,150	2.25	3,880	1.7	3,220
2			7.6	12,700	6.35	10,270	3.85	6,080	2.2	3,810	1.8	3,330
3			7.5	12,500	6.25	10,090	3.8	6,000	2.2	3,810	1.8	3,330
4			7.5	12,500	6.15	9,910	3.7	5,850	2.2	3,810	1.8	3.330
5			7.5	12,500	6.1	9,820	3.65	5,780	2.2	3,810	1.9	3,450
6		....	7.4	12,300	6.0	9,640	3.6	5,700	2.2	3,810	2.0	3,570
7			7.3	12,100	5.95	9,550	3.55	5,640	2.1	3,690	....	3,690
8			7.1	11,700	5.8	9,280	3.5	5,550	2.05	3,630	....	3,690
9			7.0	11,500	5.8	9,280	3.5	5,550	2.0	3,570	2.2	3,810
10			7.0	11,500	5.7	9,100	3.45	5,480	2.0	3,570	....	3,570
11			6.9	11,300	5.6	8,920	3.4	5,410	1.95	3,510	....	3,450
12			6.8	11,110	5.5	8,750	3.35	5,340	1.9	3,450	1.8	3,330
13		......	6.75	11,000	5.35	8,490	3.3	5,270	1.8	3,330	....	3,330
14			6.8	11,110	5.2	8,240	3.25	5,200	1.7	3,220	....	3,220
15	....	....	6.7	10,920	5.1	8,070	3.2	5,130	1.7	3,220	....	3,220
16	8.8	15,160	6.7	10,920	5.0	7,900	3.15	5,060	1.65	3,160	1.7	3.220
17	8.6	14,720	6.85	11,200	5.0	7,900	3.1	4,990	1.6	3,110	....	3,220
18	8.5	14,500	6.8	11,110	4.9	7,730	3.0	4,850	1.6	3,110	....	3,110
19	8.4	14,300	7.2	11,900	4.8	7,560	2.9	4,720	1.55	3,060	1.6	3,110
20	8.4	14,300	7.25	12,000	4.7	7,390	2.85	4,660	1.5	3,000	....	3,110
21	8.3	14,100	7.35	12.200	4.6	7,230	2.8	4,590	1.5	3,000	....	3,110
22	8.2	13,900	7.5	12,500	4.5	7,070	2.75	4,520	1.5	3,000	....	3,220
23	8.1	13,700	7.4	12,300	4.4	6,910	2.7	4,460	1.5	3,000	1.7	3,220
24	8.0	13,500	7.3	12,100	4.35	6,830	2.65	4,390	1.5	3,000	....	3,220
25	8.0	13,500	7.2	11,900	4.3	6,750	2.6	4,330	1.5	3,000	....	3,220
26	7.9	13,300	7.1	11,700	4.25	6,680	2.5	4,200	1.5	3,000	....	3,220
27	7.9	13,300	7.0	11,500	4.2	6,600	2.5	4,200	1.55	3,060	1.7	3,220
28	8.0	13,500	6.9	11,300	4.1	6,450	2.45	4,140	1.6	3,110	....	3,110
29	8.0	13,500	6.8	11,110	4.0	6,300	2.4	4,070	1.6	3,110	....	3,110
30	7.9	13,300	6.65	10,820	4.0	6,300	2.3	3,940	1.6	3,110	....	3,110
31	....	....	6.55	10,620	4.0	6,300	....	....	1.65	3,160	....	....

Day.	December.	
1	2.10	Ice3,110
2	....	3,110
3	....	3,110
4	3.0	3,110
5	....	3,110
6	....	3,000
7	....	3,000
8	2.8	3,000
9	....	3,000
10	....	3,000
11	3.4	Frozen
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
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26		
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30		
31		

Monthly Discharge of Nechako River near Fort Fraser, B.C., for 1915.

(Drainage area, 6,150 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
July	13,100	10,620	11,700	1.90	2.19	719,000
August	10,450	6,300	8,120	1.32	1.52	499,000
September	6,150	3,940	5,040	0.82	0.92	300,000
October	3,880	3,000	3,330	0.54	0.62	205,000
November	3,810	3,110	3,300	0.54	0.60	196,000
December	....	....	....	....	....	....
The period	13,100	3,000	6,298	1.02	5.85	1,919,000

NECHAKO RIVER, VANDERHOOF—(4006).

Location.—At the ferry crossing, about ½ mile from the town of Vanderhoof.

Records Available.—July 21 to November 8, 1915.

Drainage Area.—Approximately 9,500 square miles.

Gauge.—Chain gauge on right bank of river, about 25 yards above ferry landing. Daily gauge readings by Mr. R. Stuart.

Channel.—Permanent channel of even cross-section, straight for 1,000 feet above and below section.

Discharge Measurements.—Four measurements during open season and one in early winter, 1915. Measurements are made from a canoe, anchored to a tagline, 50 feet above the ferry.

Winter Flow.—The river freezes early in November and is frozen over until April. Frazil and anchor ice affect the flow in the early winter.

Accuracy.—"C." The section is good, and the meterings are well distributed. Results should be within 15%.

Discharge Measurements of Nechako River near Vanderhoof, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft	Ft. per sec.	Feet.	Sec.-ft.
July 22	Chisholm & Challies	1,521	447	4,050	3.30	5.70	13,400
Aug. 25	Elliott & Challies	1,521	435	2,730	2.77	2.60	7,580
Sept. 22	J. A. Elliott	1,521	413	2,070	2.63	1.00	5,580
Oct. 20	J. A. Elliott	1,521	390	1,600	2.43	-0.1	3,890

Daily Gauge Height and Discharge of Nechako River near Vanderhoof, B.C., for 1915.

(Drainage area, 9,500 square miles.)

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			4.8	11,570	2.2	7,050	0.6	4,780	0.1	4,130		
2			4.6	11,190	2.1	6,900	0.5	4,650	0.1	4,130		
3			4.6	11,190	2.0	6,750	0.5	4,650	0.1	4,130		
4			4.55	11,100	2.0	6,750	0.5	4,650	0.1	4,130		
5			4.4	10,810	1.9	6,600	0.4	4,520	0.2	4,260		
6			4.4	10,810	1.9	6,600	0.4	4,520	0.2	4,260		
7			4.3	10,620	1.8	6,450	0.3	4,390	0.2	4,260		
8			4.2	10,430	1.8	6,450	0.3	4,390	0.2	4,260		
9			4.1	10,240	1.7	6,300	0.2	4,260	Ice	Frozen		
10			4.0	10,050	1.7	6,300	0.2	4,260				
11			4.0	10,050	1.6	6,150	0.2	4,260				
12			3.8	9,710	1.6	6,150	0.2	4,260				
13			3.7	9,540	1.5	6,000	0.1	4,130				
14			3.6	9,370	1.4	5,860	0.1	4,130				
15			3.5	9,200	1.4	5,860	0.1	4,130				
16			3.4	9,030	1.3	5,720	0.0	4,000				
17			3.3	8,860	1.3	5,720	0.0	4,000				
18			3.2	8,690	1.2	5,580	−0.10	3,870				
19			3.1	8,520	1.2	5,580	−0.10	3,870				
20			3.0	8,350	1.1	5,440	−0.10	3,870				
21	5.6	13,150	2.9	8,180	1.1	5,440	−0.20	3,740				
22	5.7	13,350	2.8	8,010	1.0	5,330	−0.20	3,740				
23	5.7	13,350	2.7	7,840	0.9	5,170	−0.20	3,740				
24	5.6	13,150	2.6	7,670	0.9	5,170	−0.20	3,740				
25	5.5	12,950	2.6	7,670	0.9	5,170	−0.20	3,740				
26	5.4	12,750	2.5	7,500	0.8	5,040	−0.20	3,740				
27	5.4	12,750	2.5	7,500	0.8	5,040	−0.10	3,870				
28	5.2	12,350	2.4	7,350	0.7	4,910	−0.10	3,870				
29	5.1	12,150	2.3	7,200	0.6	4,780	−0.10	3,870				
30	5.0	11,950	2.3	7,200	0.6	4,780	0.00	4,000				
31	4.9	11,780	2.2	7,050			0.00	4,000				

Monthly Discharge of Nechako River near Vanderhoof, B.C., for 1915.

(Drainage area, 9,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
August	11,600	7,050	9,110	0.96	1.11	560,000
September	7,050	4,780	5,830	0.61	0.68	347,000
October	4,780	3,740	4,120	0.43	0.50	253,000
The period	11,600	3,740	6,353	0.66	2.29	1,160,000

SKEENA RIVER.

The Skeena river is about 335 miles long and drains a territory of about 19,000 square miles. It rises in the eastern slopes of the Coast range and for 180 miles follows the general direction of this mountain system, then, at a point near Hazelton, it turns south-west and cuts across the range, to reach the Pacific ocean. In its upper reaches the Skeena is very swift and flows through numerous canyons and boulder-strewn rapids. The lower part of the river is wide and swift-flowing; it is divided into several channels by the many alluvial islands in its passage through the coast range. Tidal influence extends up the river for about 40 miles.

Prior to and during the construction of the Grand Trunk Pacific Railway, the Skeena was navigated by river steamers to Hazelton, at the mouth of the Bulkley, a distance of 154 miles. Navigation, except near the mouth, is difficult and dangerous.

Probably the most important industry connected with the Skeena river is the salmon fishing. The Skeena is a noted salmon river and several canneries have been established for some years near the mouth.

The main line of the Grand Trunk Pacific Railway follows the lower 154 miles of the river to Hazelton. The route of the proposed extension of this railway from Hazelton to Dawson, follows the upper part of the Skeena for about 130 miles.

The Skeena valley has a general width of 2 miles, decreasing as it ascends. The mountains on either side seldom exceed 3,000 feet in height. The principal tributaries of Skeena river are the Kitsumgallum, Kitwanga, Kispiox, Kuldo, Exchamsiks, Kwinitsa, Seaxe, Kasiks and Exstew, on the north and west; Exstall, Lakelse, Zymoetz, Bulkley, Kitsequekla, Babine, Shequnya, Kleanza and Chimdemash, on the south and west, most of them draining valleys with a considerable extent of agricultural land.

There are no power developments on the Skeena at present. It has a fall of about 725 feet in the 154 miles between Hazelton and its mouth, but the construction of the railway along its banks prevents any extensive utilization for power purposes.

There is at present only one gauging station on the Skeena river. It is located at the Hazelton ferry, about half a mile above the mouth of the Bulkley. This station was established in July, 1915. Readings are made daily from a chain gauge. Discharge measurements are made from the canoe ferry, a tagged line being stretched across the river to mark points of observation.

SKEENA RIVER, HAZELTON.—(4005).

Location.—At ferry, at Old Hazelton, about ¾ mile above the mouth of Bulkley river.

Records Available.—July 15 to December 31, 1915.

Drainage Area.—Approximately 13,300 square miles.

Gauge.—Chain gauge on a long pole braced over left bank, near ferry. Read daily by Jas. MacKay.

Channel.—Straight above and below section. Bed is permanent and current is very swift. At high stage, surface velocities only can be obtained.

Discharge Measurements.—Four well-distributed measurements during open season, 1915.

Winter Flow.—River freezes over early in December. Winter flow is affected by ice jams near confluence with Bulkley river.

Accuracy.—Below gauge height of 5.0 feet results should be within 15%. Above 5.0 feet within 20%.

Discharge Measurements of Skeena River at Hazelton, B.C., for 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
July 16	Chisholm & Challies	1,521	450	4,460	6.32	5.55	28,200
Aug. 28	Elliott & Challies	1,521	415	3,340	4.99	3.00	16,550
Sept. 25	J. A. Elliott	1,521	380	2,190	3.27	0.20	7,150
Oct. 23	J. A. Elliott	1,521	423	3,490	5.24	3.40	18,280

Daily Gauge Height and Discharge of Skeena River at Hazelton, B.C., for 1915.

(Drainage area, 13,300 square miles.)

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	....	....	6.8	34,880	3.5	18,600	2.0	12,800	2.2	13,520	-0.2	6,120
2	....	....	6.6	33,760	3.3	17,800	1.9	12,460	2.0	12,800	-0.2	6,120
3	....	....	6.0	30,600	3.2	17,400	1.2	10,140	1.9	12,460	-0.3	5,880
4	....	....	7.0	36,000	3.2	19,040	1.0	9,500	1.9	12,460	-0.3	5,880
5	....	....	6.5	33,200	3.6	19,040	1.0	9,500	1.3	10,460	-0.3	5,880
6	....	....	5.7	29,100	2.8	15,800	1.0	9,500	1.0	9,500	-0.3	5,880
7	....	....	5.8	29,600	2.6	15,000	0.8	8,900	1.0	9,500	-0.4	5,640
8	....	....	5.9	30,100	2.5	14,600	0.6	8,300	0.9	9,200	-0.4	5,640
9	....	....	5.5	28,100	2.3	13,880	0.6	8,300	0.8	8,900	-0.4	5,640
10	....	....	5.9	30,100	1.9	12,460	0.6	8,300	0.8	8,900	-0.4	5,640
11	....	....	6.3	32,160	1.6	11,440	0.7	8,600	0.7	8,600	-0.3	5,880
12	....	....	6.5	33,200	1.3	10,460	0.7	8,600	0.7	8,600	-0.2	6,120
13	....	....	5.6	28,600	1.3	10,460	0.9	9,200	0.6	8,300	-0.2	6,120
14	....	....	5.4	27,600	1.2	10,140	0.9	9,200	0.5	8,000	-0.2	6,120
15	....	....	5.2	26,600	1.3	10,460	1.0	9,500	0.5	8,000	-0.3	5,880
16	5.5	28,100	4.9	25,120	1.6	11,440	8.2	42,800	0.7	8,600	-0.3	5,880
17	5.4	27,600	4.8	24,640	1.6	11,440	9.6	51,440	0.5	8,000	-0.4	5,640
18	5.1	26,100	4.8	24,640	1.9	12,460	9.8	52,720	0.5	8,000	-0.4	5,640
19	5.4	27,600	4.7	24,160	1.5	11,100	9.6	51,440	0.4	7,720	-0.4	5,640
20	5.5	28,100	4.6	23,680	1.3	10,460	9.3	49,520	0.2	7,160	-0.4	5,640
21	6.0	30,600	4.4	22,720	1.1	9,820	4.2	21,760	0.2	7,160	-0.4	5,640
22	9.5	47,920	4.0	20,800	0.7	8,600	3.7	19,480	0.2	7,160	-0.3	5,880
23	8.2	42,800	3.8	19,920	0.5	8,000	3.4	18,200	0.1	6,880	-0.3	5,880
24	7.6	39,360	3.8	19,920	0.3	7,440	3.4	18,200	0.0	6,600	-0.3	5,880
25	7.0	36,000	3.7	19,480	0.2	7,160	3.0	16,600	0.0	6,600	-0.3	5,880
26	6.9	35,440	3.2	17,400	0.3	7,440	2.8	15,800	-0.1	6,360	-0.3	5,880
27	6.7	34,320	3.2	17,400	0.5	8,000	2.5	14,600	-0.2	6,120	-0.3	5,880
28	6.5	33,200	3.2	17,400	0.9	9,200	2.3	13,880	-0.2	6,120	-0.3	5,880
29	6.5	33,200	3.3	17,800	1.2	10,140	2.3	13,880	-0.2	6,120	-0.3	5,880
30	6.6	33,760	3.4	18,200	2.0	12,800	2.2	13,520	-0.2	6,120	-0.3	5,880
31	6.65	34,040	3.5	18,600	....	....	2.3	13,880	....	....	-0.3	5,880

Monthly Discharge of Skeena River at Hazelton, B.C., for 1915.

(Drainage area, 13,300 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
August	36,000	17,400	25,600	1.92	2.21	1,570,000
September	19,040	7,160	12,000	0.90	1.00	714,000
October	52,700	8,300	18,400	1.38	1.59	1,130,000
November	13,500	6,120	8,460	0.64	0.72	503,000
December	6,120	5,640	5,850	0.44	0.51	360,000
The period	52,700	5,640	14,060	1.06	6.03	4,277,000

FORT GEORGE DISTRICT.—MISCELLANEOUS METERING STATIONS.

Date. 1915	Stream.	Tributary to	Locality.	Engineer.	Gauge Height	Dis-charge
July 11	Bulkley	Skeena	Smithers	K. G. Chisholm	......	7,920
June 23	Chilako	Nechako	Miller's Ranch	K. G. Chisholm	2.68	112
Sept. 2	Chilako	Nechako	Miller's Ranch	J. A. Elliott	1.90	50
Oct. 29	Chilako	Nechako	Miller's Ranch	J. A. Elliott	2.10	66
Aug. 19	Dome	Fraser	Mile 145, B.C.	J. A. Elliott	1.09	170
Sept. 5	Dome	Fraser	Mile 145, B.C.	J. A. Elliott	0.85	92
Aug. 18	Fraser	....	Mile 145, B.C.	J. A. Elliott	......	29,900
July 19	Nautley	Nechako	Fort Fraser	K. G. Chisholm	2.30	1,370
June 18	Stoney	Nechako	Vanderhoof	K. G. Chisholm	0.50	7.70
July 20	Stoney	Nechako	Vanderhoof	K. G. Chisholm	0.50	7.90
Aug. 25	Stoney	Nechako	Vanderhoof	J. A. Elliott	0.25	2.03

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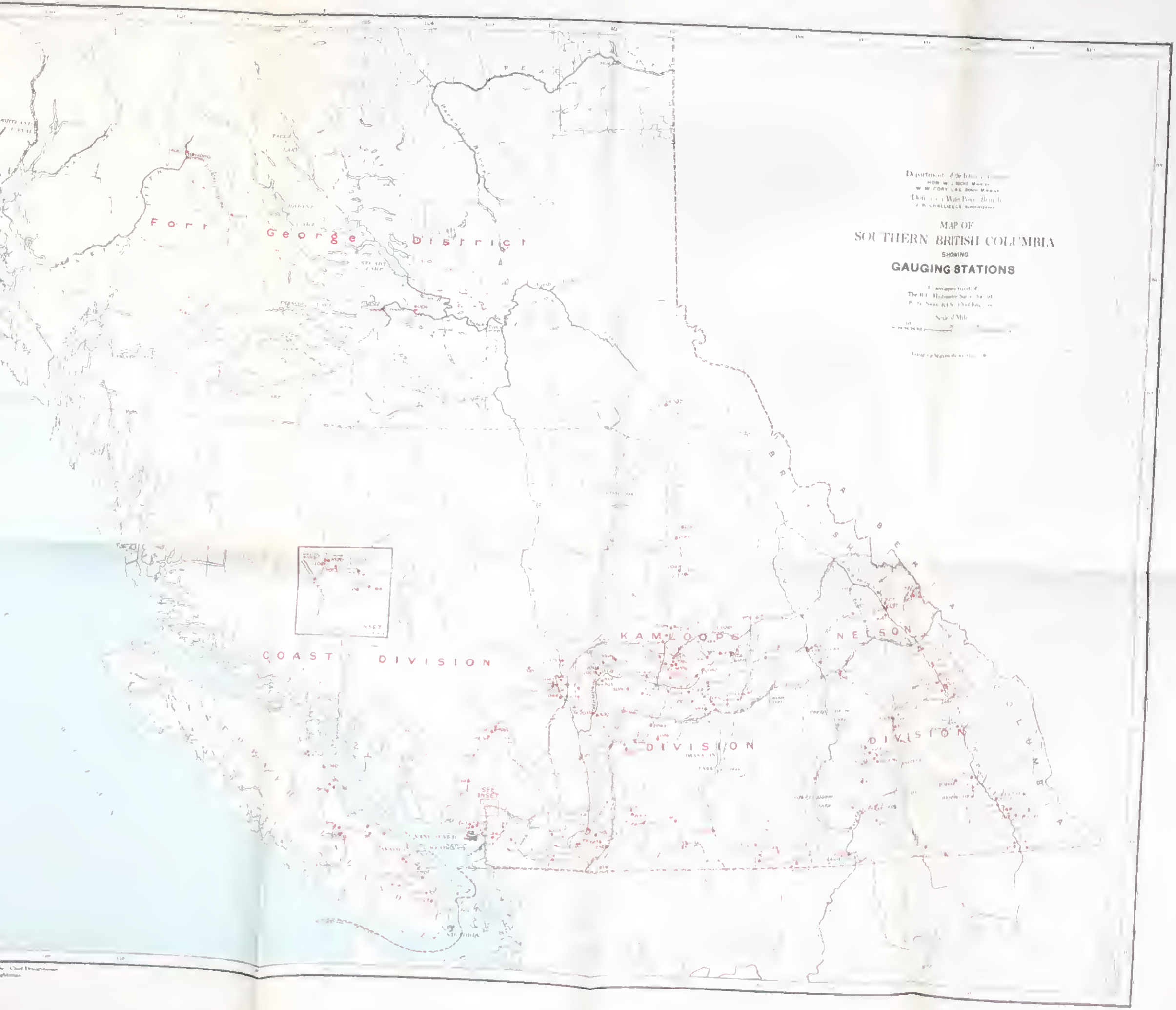
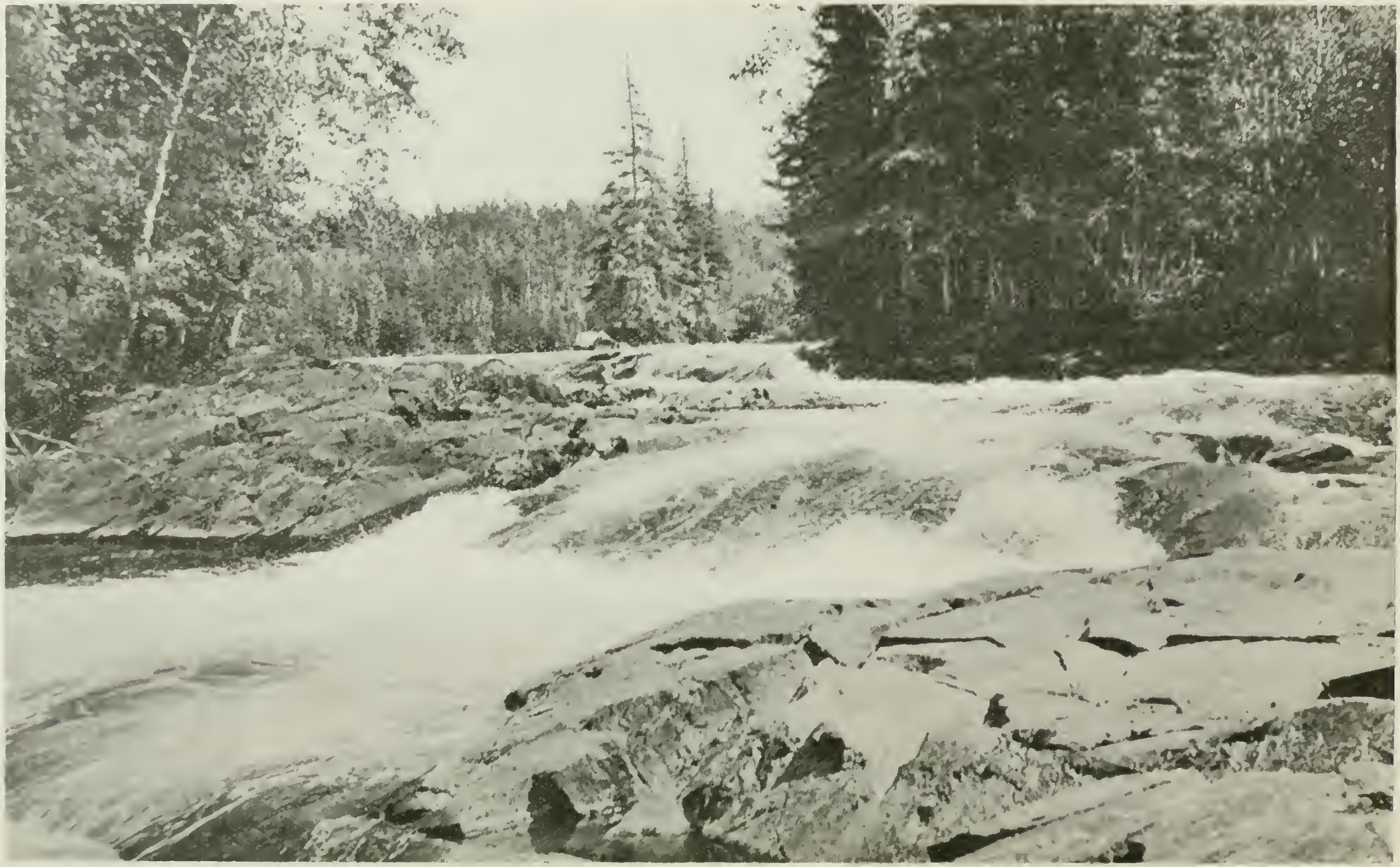

Department of the Interior, Canada
HON. W. J. ROCHE, Minister
W. W. CORY, C.M.G., Deputy Minister
Dominion Water Power Branch
J. B. CHALLIES, Superintendent
MAP OF
SOUTHERN BRITISH COLUMBIA
SHOWING
GAUGING STATIONS
[illegible]
Scale of Miles
Fort George District
Coast Division
Kamloops Division
Nelson Division
British Columbia
Alberta
Peace
See Inset
Inset
Vancouver
Victoria



Taken by D. B. Gow.

GRASS RIVER—UPPER PART OF WEKUSKO RAPIDS.

DEPARTMENT OF THE INTERIOR—CANADA
Hon. W. J. ROCHE, Minister. W. W. CORY, Deputy Minister.

DOMINION WATER POWER BRANCH,
J. B. CHALLIES, C.E., Superintendent.

WATER RESOURCES PAPER No. 19

PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC SURVEY
FOR
THE CALENDAR YEAR 1915

BY

M. C. HENDRY, A.M. Can. Soc. C.E.
Chief Engineer

Prepared under the Direction of the Superintendent of Water Power.

PRINTED BY ORDER OF PARLIAMENT

OTTAWA
PRINTED BY J. de L. TACHÉ,
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1917

[No. 25f—1917]

To Field Marshal, His Royal Highness Prince Arthur William Patrick Albert, Duke of Connaught and of Strathearn, K.G., K.T., K.P., etc., etc., etc., Governor General and Commander in Chief of the Dominion of Canada.

MAY IT PLEASE YOUR ROYAL HIGHNESS:

The undersigned has the honour to lay before Your Royal Highness the Progress Report of the Manitoba Hydrometric Survey for the calendar year 1915.

Respectfully submitted,

W. J. ROCHE,
Minister of the Interior

Ottawa, May 31, 1916.

Department of the Interior,
Ottawa, May 31, 1916.

The Honourable W. J. Roche, M.D.,
Minister of the Interior.

Sir,—I have the honour to submit the Progress Report of the Manitoba Hydrometric Survey for the calendar year 1915, and to recommend that it be published as Water Resources Paper No. 19 of the Dominion Water Power Branch.

I have the honour to be, Sir,

Your obedient servant,

W. W. CORY,
Deputy Minister of the Interior.

DEPARTMENT OF THE INTERIOR, DOMINION WATER POWER BRANCH,
Ottawa, May 31, 1916.

W. W. CORY, ESQ., C.M.G.,
Deputy Minister of the Interior.

SIR,—I have the honour to submit the attached Progress Report of the Manitoba Hydrometric Survey for the calendar year 1915, by M. C. Hendry, A.M.Can.Soc. C.E., Chief Engineer.

In view of its important bearing on the industrial development of Manitoba, I would recommend that it be published as Water Resources Paper No. 19 of the Dominion Water Power Branch.

Respectfully submitted,

J. B. CHALLIES,
Superintendent.

J. B. Challies, Esq., C.E.;
Superintendent, Dominion Water Power Branch,
Department of the Interior,
Ottawa, Ont.

Winnipeg, May 1, 1916.

Sir,—

I have the honour to submit herewith the manuscript of the Progress Report of the Manitoba Hydrometric Survey.

This report covers the Hydrometric work carried on by this Survey during the year 1915. I would request that it be published as one of the Water Resources Papers of the Dominion Water Power Branch.

I have the honour to be, sir,

Your obedient servant,

M. C. HENDRY,
Chief Engineer.

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PROGRESS REPORT

OF THE

MANITOBA HYDROMETRIC SURVEY

FOR

THE CALENDAR YEAR, 1915

PART 1

PART I

PROGRESS REPORT OF THE MANITOBA HYDROMETRIC SURVEY FOR THE CALENDAR YEAR 1915

INTRODUCTION.

The report presented herewith covers the hydrometric work carried on throughout the province of Manitoba during the Calendar year 1915. There is also included in this report, data that has been collected by officers of the Survey in connection with hydrometric studies made at the Outlets of the Lake of the Woods. The latter information relates particularly to gauge heights, etc., which were observed by different interested parties at various times prior to the interception of the work of the Manitoba Hydrometric Survey at this point. The information so obtained is of great value and was compiled, collated and made available to the Consulting Engineers of the International Joint Commission for use in connection with the reference relating to the regulation of the Lake of the Woods.

The gathering of hydrometric data is of prime importance, not only from a hydraulic power standpoint, but also in connection with other uses of the surface water supply. The various uses for which stream flow data is required in Manitoba may be enumerated as follows:—

1. Domestic, municipal and manufacturing purposes.
2. Irrigation.
3. Water power.
4. Drainage.
5. Sewage disposal.
6. Navigation.
7. Flood prevention.

Throughout the Provinces numerous towns and villages are dependent upon the rivers for their domestic water supply; the demand will rapidly increase with the population and information with regard to the amount of water available will be essential.

In the southwestern part of the Province where the average annual rainfall varies between 14 and 17 inches and where agriculture is chiefly pursued, irrigation may become important. Throughout the Province many of the rivers present power possibilities, and studies have been made of them with a view to determining their probable economic value. The true value of these potential water powers cannot be determined without a thorough knowledge of the water available in the streams, particularly under low water conditions. In the northern and southeastern portions of the Province, the reclamation of large tracts of land by drainage may be profitably undertaken. With the rapid filling up of the country, the necessity of throwing open reclaimed lands for settlement will become more pressing, and in connection with such reclamation schemes, a complete knowledge of the streams forming the natural outlets for such drainage schemes is a prime requisite.

The use of the streams of the Province in connection with sewage disposal will soon command attention, as the rapid growth of the towns and villages will render necessary the regulation of waste disposal from these municipalities in such a manner as to obviate any possible danger to the rest of the community. In order that this question may be handled intelligently, a knowledge of the discharge of the streams is of extreme importance.

Several of the main rivers in the Province might be utilized for navigation purposes, in fact before the coming of the railway the Red River was the only means of communication with the outside world. Improvement for navigation purposes is being urged in many quarters and demands the study of this and other streams.

ORGANIZATION AND SCOPE.

The organization of the survey is the same as in former years, though a number of changes in the personnel have occurred, due, almost without exception, to enlistment for active service.

The methods used in collecting the data are based upon those followed by the Water Resources Division of the United States Geological Survey. The different streams to be studied are investigated and suitable sites selected for the establishment of metering stations, the selection of the stations depending upon the physical features and the need of data in any particular locality. At these metering stations, gauges are established and some person living in the locality is engaged to read the gauge daily. These daily observations are recorded in a book provided for the purpose, which is examined by the engineer on each of his visits. The readings as entered in the book are transferred to cards by the gauge reader and forwarded weekly to the Chief Engineer. The records are then copied on forms and filed in the office. At the end of each three months the gauge books are renewed, the old ones are forwarded to the office and the readings, as copied from the cards, are checked against those entered in the gauge books by the gauge reader. At the end of the season, discharge curves are constructed for each station from the results of the meterings. Rating tables are compiled and with these and the records of daily gauge heights as a basis, tables of Daily, Monthly and Yearly Discharge are computed. These are the results which are published herein.

On the organization of the Manitoba Hydrometric Survey, the work of the Winnipeg River Power Survey was merged with it, and the former now carries on all hydrometric storage, power or river improvement investigations. By this arrangement the work naturally falling within the scope of the survey may be carried on systematically and conservation may be dealt with in a comprehensive manner with a view to determining the best use of the available water supply.

In gathering this stream flow data it is believed that the results obtained are sufficiently accurate for all practical purposes, the aim being, not to concentrate on few streams and so obtain records of extreme accuracy, but rather to spread the effort over as wide a territory as possible and so serve as many purposes as possible without unduly sacrificing the accuracy of results. In this connection it is essential that the records, in order that they may properly cover all possible range in stage of the rivers investigated, should extend over a considerable term of years. The length of this term will vary with the character and importance of the stream investigated; on some streams the term should be from five to ten years, while in other cases from ten to twenty years is desirable. This variation will depend both upon the importance of the stream and the correlation of the results with the records of other streams in the vicinity. To quote from an authority on this subject,—"the object should be to gauge a certain number of streams at all seasons of the year so as to ascertain their total discharge and its seasonable distribution, also to gauge others at certain stages which have been determined to be the critical points in their regimen." It may be stated here that the United States Geological Survey considers that, owing to the constantly changing flow of the streams, data of reasonable accuracy showing the distribution of flow over several consecutive years are of more importance than very accurate measurements covering short periods of time.

In making use of the records here presented, caution should be exercised in drawing conclusions. Owing to the very limited period of time over which a great many of the records extend, and the fact that the observations are often unsupported by others made before the organization of the survey, considerable error in the conclusions reached may very easily occur.

DISTRICTS.

During the past year seventy stations were operated, at some of these continuous records were obtained, while at others only miscellaneous measurements were secured.

The territory covered by the work is divided, for convenience of description, into several main divisions, which conform generally to the several drainage systems met with. These may be enumerated as follows:—

1. Winnipeg River and Tributaries.
2. Red River and Tributaries.
3. Assiniboine River and Tributaries.
4. Saskatchewan River and district west of Lake Winnipegosis.
5. East shore of Lake Winnipeg.
6. Hudson Bay Drainage (Nelson River).

WINNIPEG RIVER AND TRIBUTARIES.

This district comprises all the territory lying between the Outlets of the Lake of the Woods and lake Winnipeg which is tributary to the Winnipeg river.

The Outlets of the Lake of the Woods are being given special attention owing to the effect of run-off at this point upon the surface levels of the Lake of the Woods. The reference now before the International Joint Commission relative to the regulation of the lake has necessitated a very comprehensive study of the run-off conditions. The number of outlets from the lake and their method of control has necessitated keeping an engineer and assistant on the ground continuously. Data of a meteorological nature is also being gathered.

The tributaries of the Winnipeg river are not numerous, and with one exception, the English river, are of little magnitude. The English river joins the Winnipeg in the vicinity of the Interprovincial boundary between Ontario and Manitoba, and drains all the country lying to the north and east of the Lake of the Woods district. Lying almost entirely in unsurveyed territory, its drainage area is rather indeterminate, but roughly speaking, it forms somewhat less than one-half of the total tributary drainage area lying above the junction of the two rivers. A station has been established on this river near the mouth, but owing to the remoteness from settlement, it has been found impossible to secure the services of a gauge reader. On this account it has not been possible to determine the daily discharge directly, only scattered meterings being available, but from a consideration of the measurements taken on the Winnipeg river above and below this confluence, the discharge of the English river may be arrived at approximately. The smaller tributaries of the Winnipeg have been metered and records of the discharge kept more or less systematically, depending upon their importance. On the main river, stations have been established at Whitedog falls—north and south channels—and Slave falls, and one on the Pinawa channel near the Control dam, also others at the forebay and tailrace of the Winnipeg Electric Railway plant in the latter channel. The latter stations were established with a view to rating the power plant.

This district lies almost entirely within the Laurentian formation, in fact, the Winnipeg river and the Lake of the Woods may be said to form the southwestern boundary of that formation. This would account in a great measure for the small number of rivers tributary to the basin from the southwest.

The granites and gneisses of the Laurentian formation underlie the whole region, and the topographical features are typical; lakes and rivers abounding throughout the district. Rock outcroppings are very frequent and the soil covering is shallow, conditions which would tend to rapid run-off were they not offset by the numerous lakes and muskegs throughout the district.

The forest covering of the district varies, in some parts it is sparse owing to the shallowness of soil; in other parts dense growths of evergreen such as spruce, pine and balsam are to be found with here and there clumps of birch. Considerable lumbering has been done in the district so that for the most part the larger stands of lumber have been cut off. In other parts the forest has been overrun with fire so that now much of the standing timber is second growth.

RED RIVER DISTRICT.

That portion of the Red River valley lying below the International Boundary and the territory drained by the tributaries with the exception of the Assiniboine, comprises the

Red river District. The nature of the area drained by the river within the Province varies between the swampy muskeg country bordering the Laurentian formation to the east and the open prairie to the west.

Owing to the nature of the eastern part of the drainage area, land reclamation by drainage is to be expected and such work will naturally affect the range in stage of the river and tributaries concerned. This change in regimen caused by the operation of large drainage schemes in the northern part of Minnesota has to some extent already been noticed. These conditions render the study of the river advisable especially owing to the possibility of International questions arising. Drainage already in operation or to be anticipated, however, is not the only reason for collecting hydrometric data. The importance of the river from a navigation standpoint has been put forward on numerous occasions, in fact a careful survey with the idea of its improvement for that purpose was carried out through this organization. Such improvement would not revive an early use of the river as the chief artery of communication and transport with the outside world. In order that all phases of the question may be looked into, metering stations have been established near the International Boundary at Emerson, and at Winnipeg, and gauges were established at several intermediate points. Stations have been operated on the tributaries, viz., the Roseau, the Rat, the Morris and the Seine.

ASSINIBOINE RIVER DISTRICT.

The Assiniboine river which is the chief tributary of the Red, drains the country to the west of the Duck and Riding Mountains and north of the International boundary; some of its tributaries have their source within the province of Saskatchewan. The southern and western part of the drainage area may be termed prairie country, having scattered timber bluffs. The northern section of the area has a greater tree covering, the Riding Mountain district at the source of one of the tributaries being well timbered and lying within a forest reserve. The streams rising in these two areas are characteristic of the country which they drain. One of the chief tributaries, the Souris, has the extreme low winter flow characteristic of the prairie streams. It rises within the province of Saskatchewan, flows southeast, crossing the International boundary into North Dakota, then swings northeast re-crossing the boundary into Manitoba. The stream flows through what may be termed the dry belt of Manitoba, the district drained comprising that part of the Province which has the lowest annual rainfall, this varying between 14 and 17 inches. The Little Saskatchewan, which is also a tributary of the Assiniboine, rises in the Riding Mountains and flows in a general southerly direction joining the main river near Brandon.

As the main river and its branches drain the well populated parts of the Province, it is important as a source of domestic water supply or a means of sewage disposal. In addition to the above, its possible use for irrigation purposes may be anticipated in the southwestern part of the Province, and these demands added to the demand for power purposes render a careful hydrometric study of the river advisable. During the past season a number of new stations have been established on the upper waters of the Little Saskatchewan, in connection with certain water power studies on that river. As opportunity offers it is intended to extend these stations throughout the basin in order that a thorough knowledge of the Assiniboine may be obtained.

SASKATCHEWAN RIVER AND DISTRICT WEST OF LAKE WINNIPEGOSIS.

In this district there are a large number of streams of variable size tributary directly or indirectly to Lake Winnipegosis. The Saskatchewan river, though belonging to the district, flows through the northern portion and empties into lake Winnipeg.

With a few exceptions all the rivers tributary to lake Winnipegosis have their source in either the Riding, Duck or Porcupine mountains. The streams are not of great length and the flow is subject to considerable fluctuation.

Some of these streams are not of immediate interest from a hydrological standpoint, nevertheless as the district becomes populated their importance will increase; new towns springing up will be dependent on them for water supply and in some cases the success of drainage schemes will depend largely upon the possibility of utilizing the existing streams as outlets. Vast areas along the Saskatchewan river may be profitably reclaimed by channel improvements in the main river combined with a system of interior drainage. Certain of these rivers are capable of development from a power standpoint and the most important in the district viewed from that angle is perhaps the Saskatchewan river. This river has for its drainage basin practically all that section of Alberta and about two-thirds of Saskatchewan lying south of the forty-fourth parallel of latitude. There are several points at which this river might be developed for power purposes.

EAST SHORE OF LAKE WINNIPEG.

In the district covered by the drainage on the east side of lake Winnipeg, the country is for the most part typical of the Laurentian formation, in consequence practically all of the rivers entering on that side of the lake are interrupted at numerous points in their course by falls and rapids. At various points throughout the country are to be found stands of timber which may be utilized either for the manufacture of lumber or for pulp. With these facts in view some studies have been made of the power possibilities of the rivers, but in order that the conclusions reached may be sound, the possible run-off of the rivers should be known. The district is for the most part uninhabited, so it has been impossible to secure gauge readers. Miscellaneous measurements have been taken at various points on the river as the opportunity offered, and with the exception of the station established at Little Grand Rapids on the Berens river where daily records are obtained, these are all the records available.

HUDSON BAY DRAINAGE.

NELSON RIVER.

The Nelson river forms the sole outlet of practically all the drainage areas included in the last six districts. It forms the outlet of lake Winnipeg into which all the rivers, the Winnipeg, Red, Saskatchewan, Berens, Pigeon, Bloodvein and Dauphin (the outlet of lake Winnipegosis and lake Manitoba), empty. The fall of the Nelson between the outlet of lake Winnipeg and Hudson's Bay is in round numbers, 700 feet. A great portion of this is to be found in the form of swifts, rapids and falls. With such a vast drainage area tributary to the river the discharge must be enormous, while with so many lakes forming natural regulation basins, the minimum flow will probably bear a fairly close relation to the mean flow. The natural storage basins encountered in this drainage area are of great proportions and include the following large lakes:—lake Namakan, Rainy lake and the Lake of the Woods on the Winnipeg; lac Seul on the English, lake Manitoba, lake Dauphin, lake Winnipegosis and lake Winnipeg; there are many others of less extent; for in the Winnipeg river basin alone there are, in addition to those named, 106 lakes varying in area from 3 to 140 square miles.

The Nelson with its numerous falls and rapids and excellent natural regulation has great power possibilities, which are increasingly important as the Hudson's Bay railway nears completion and easier and cheaper transportation becomes available. The early development of some of these powers is by no means improbable. The hydrometric work undertaken in 1914 has been continued and an engineer was kept in the district during the winter and summer of 1915. In addition to this work, a number of measurements were secured at various points on the Grass and Burntwood rivers during 1915, stations and bench marks being established so that the work may be continued at a future date.

DEFINITIONS AND TERMS.

The volume of water flowing in a stream (called the "run-off" or "discharge") is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups,—

(1) Those which represent a rate of flow as "second-feet," "miner's inches" and "run-off in second-feet per square mile."

(2) Those which represent the actual quantity of water, as "run-off in depth in inches" and "acre-feet."

The units used in this report are "second-feet," "second-feet per square mile," "run-off in inches" and "acre-feet" or "mile-feet." The first two belong to the first group and the last three to the second. They may be defined as follows,—

(a) "Second-feet" is an abbreviation for cubic feet per second (c.f.s.) and is the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second, It is generally used as a fundamental unit from which others are computed by the use of factors given in the following table of equivalents.

(b) "Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

(c) "Run-off in inches" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed over the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

(d) "Acre-foot" is equivalent to 43,560 cubic feet, which quantity is the number of square feet in one acre. It is the quantity of water required to cover an acre to the depth of one foot, and is the common unit of measurement of quantity. It is generally used in connection with storage.

(e) "Mile-foot" is equivalent to 27,878,400 cubic feet, which quantity is the number of square feet in one square mile. It is the quantity of water required to cover one square mile to a depth of one foot and is equal to 640 acre-feet. While not a common unit of measurement of quantity, it is sometimes made use of in connection with large storage projects to express the quantity of water stored.

CONVENIENT EQUIVALENTS.

1 second-foot equals 35·71 British Columbia miner's inches, or one British Columbia miner's inch equals 1·68 cubic feet per minute.

1 second-foot equals 6·23 British Imperial gallons per second; equals 538·272 gallons for one day.

1 second-foot equals 7·48 United States gallons per second; equals 646,272 gallons for one day.

1 second-foot for one year covers 1 square mile 1·31 feet or 13,572 inches deep.
1 second-foot for one year equals 31,536,000 cubic feet; equals 724 acre-feet.
1 second-foot equals about 1 acre-inch per hour.
1 second-foot for one 28-day month covers 1 square mile 1·041 inches deep.
1 second-foot for one 29-day month covers 1 square mile 1·079 inches deep.
1 second-foot for one 30-day month covers 1 square mile 1·116 inches deep.
1 second-foot for one 31-day month covers 1 square mile 1·153 inches deep.
1 second-foot for one day equals 1·983 acre-feet.
1 second-foot for one 28-day month equals 55·54 acre-feet.
1 second-foot for one 29-day month equals 57·52 acre-feet.
1 second-foot for one 30-day month equals 59·50 acre-feet.
1 second-foot for one 31-day month equals 61·49 acre-feet.
100 British Imperial gallons per minute equals 0·268 second-feet.
100 United States gallons per minute equals 0·223 second-feet.
1,000,000 British Imperial gallons per day equals 1·86 second-feet.
1,000,000 United States gallons per day equals 1·55 second-feet.
1,000,000 United States gallons equals 3·07 acre-feet.
1,000,000 British Imperial gallons equals 3·68 acre-feet.
1,000,000 cubic feet equals 22·95 acre-feet.
1 acre-foot equals 43,560 cubic feet.
1 acre-foot equals 271,472 British Imperial gallons.
1 acre-foot equals 325,580 United States gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.

1 inch deep on 1 square mile equals 0·0737 second-foot per year.
1 acre equals 43,560 square feet.
1 cubic foot equals 6·23 British Imperial gallons.
1 cubic foot equals 7·48 United States gallons.
1 cubic foot of water weighs 62·5 pounds.
1 foot per second equals 0·682 miles per hour.
1 horse-power equals 550 foot pounds per second.
1 horse-power equals 746 watts or ·746 kilowatts.
1 horse-power equals 1 second-foot falling 8·80 feet.

To calculate water-power quickly:—sec. ft. x fall in feet ÷ 11 = net horse-power on water wheel, realizing 80 per cent. of theoretical power.

METHODS OF DETERMINING DISCHARGE.

In Water Resources Paper No. 4 full reference was made to the methods commonly followed in determining the discharge of streams, and it is not therefore considered necessary to repeat the same herein.

EXPLANATION OF DATA.

The following data are given for each regular station:—

1. Description of the station.
2. Table of Discharge Measurements.
3. Table of Daily Gauge Heights and Discharges.
4. Table of Monthly Discharge and Run-off.

The description gives a complete history of the station, noting especially such charges as would effect the records. There is also included information regarding the location and equipment of the station.

In the table of discharge measurements is given the date of each measurement, the name of the field engineer, meter number, width of the section, cross sectional area, mean velocity in the section, the gauge height and the discharge in cubic feet per second.

The table of daily gauge heights and discharge contains a list of the gauge heights for each day reduced to station datum and the corresponding discharge. In some cases the gauge height given is the mean of two or more readings taken at intervals during the day.

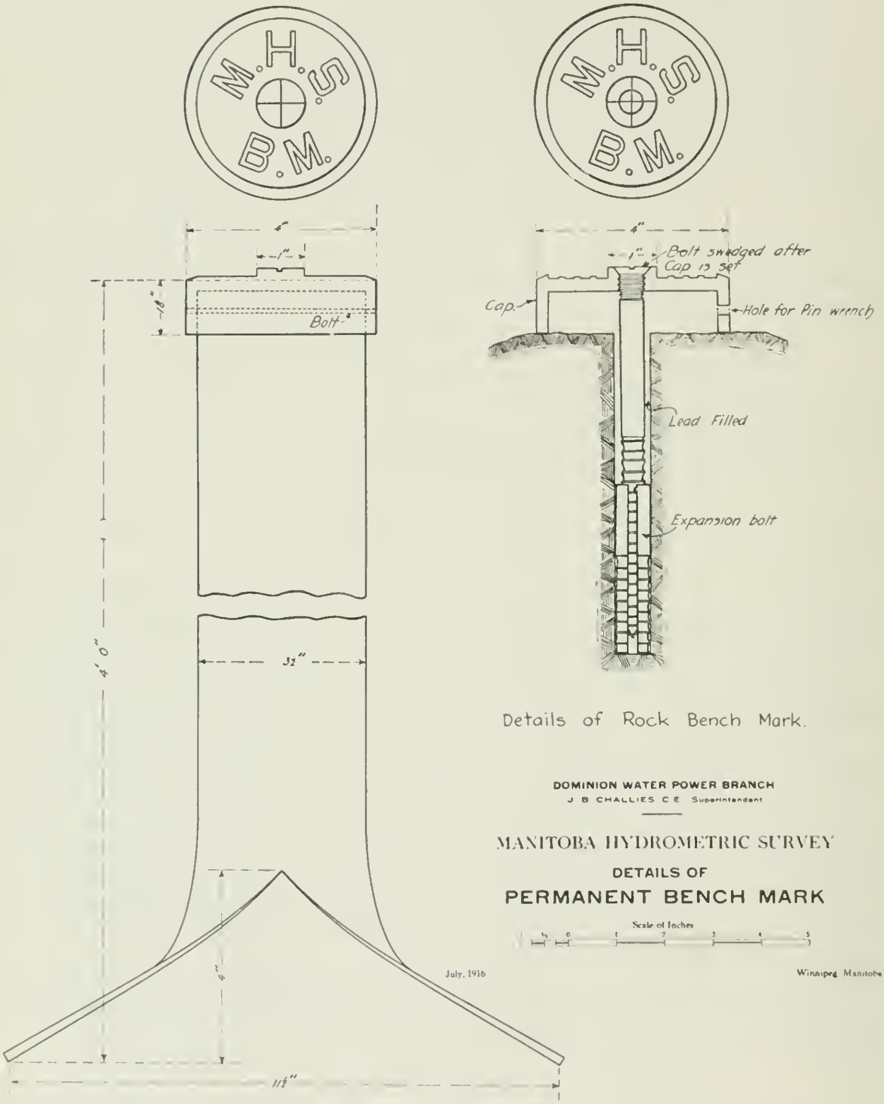
The table of monthly discharge and run-off is compiled from the foregoing table. Under "Maximum" is given the greatest mean daily discharge in feet per second occurring during the month, period or year. Similarly under "Minimum" is given the smallest discharge, and under "Mean" the mean discharge for each whole month, period or year. It should be noted that under these headings the figures represent *rates* of flow. In the other part of the table are given under the heading "Run-off Depth in Inches," the depth of which the drainage area could be carried by distributing evenly over the entire area the run-off for each month, period or year. These figures represent *quantities* of water, as do also those under the heading "Total Run-off in Acre-feet."

The size of each drainage area is obtained by planimeter from the area lying within the basin laid down on the sectional maps issued by the Department. These will be revised if necessary from time to time as new maps are issued.

BENCH MARKS.

From time to time the necessity has been felt for good permanent bench marks at the metering stations to which the gauges could be referred. During the early part of the year one was designed and a number secured. The bench mark is made up of a five-foot length of three and a half inch wrought iron-pipe, the lower six inches is split and the ends spread, a bronze cap is shrunk on to the upper end, on it being the letters, "B.M. M.H.S." The boss in the centre of the cap is the reference point. The pipe is sunk in the ground, only two or three inches being left above the surface. If rock in place is available, the cap only is used, being drilled and tapped to fit a half inch anchor bolt which may be leaded in a hole drilled

PLATE No. 1



Details of Rock Bench Mark.

Details of Earth Bench Mark.

DOMINION WATER POWER BRANCH
J B CHALLIES C E Superintendent

MANITOBA HYDROMETRIC SURVEY

DETAILS OF

PERMANENT BENCH MARK

Scale of Inches
½ 0 1 2 3 4 5

July, 1916

Winnipeg Manitoba

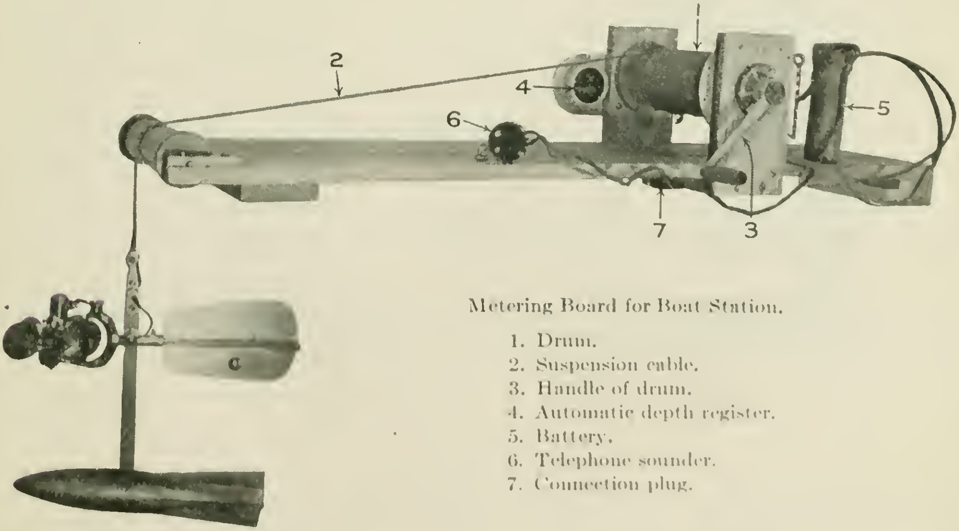
in the rock. A number of these have been placed and wherever possible are referred to some known datum.

METERING ACCESSORIES.

A number of the stations operated are on large streams where depths up to seventy-five feet are encountered. Piano wire has been used for suspending the meter, a small insulated wire forming the second side of the circuit. Lately a special steel cable of small diameter with an insulated copper core has been experimented with and has given good results, the advantage over piano wire being less liability to break through kinking and the elimination of the second wire. Where either method of suspension is adopted, a reel is necessary, so that all the stations where considerable depths are encountered are equipped with reels, a special equipment being used for metering at boat stations.

Mr. W. J. Ireland, Assistant Engineer, during the year designed a counting device for use with the reels and a number of them are now in use. The counting part of the device is similar to that used in gas meters. It is connected to the spindle of the reel by a train of gears, the counter and gears being enclosed in a metal case. Through the connection, each revolution or part of a revolution of the reel or drum is recorded on the dial of the encounter. By turning in one direction the revolutions are added and by reversing the direction they are subtracted. The counter may readily be thrown out of gear and the dial reading brought to zero. By using a reel exactly one foot in circumference and setting the dial to read zero when the meter is at the surface of the water any position with reference to the surface of the water is automatically registered on the dial. The counting device may be detached from the reel by loosening three thumb screws; they are interchangeable so that one may be carried by each field engineer and used with any reel.

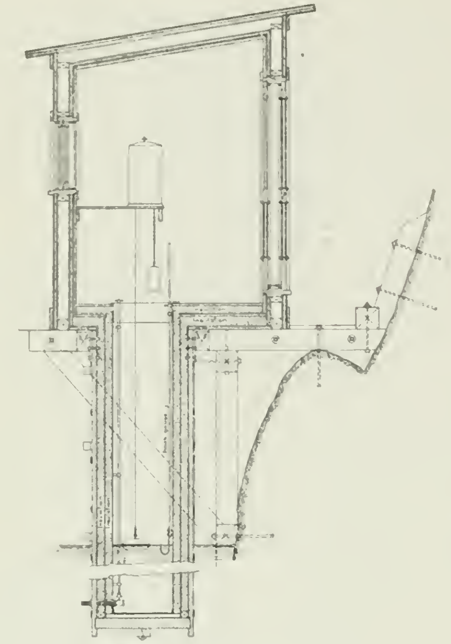
The Nelson and the Saskatchewan are two of the largest rivers metered; on each of these there are Boat Stations. The velocities being high, it has been found that a canoe does not afford a steady enough working platform. The method now employed is to secure two canoes together parallel to one another by means of three pieces of oak laid across the gunwhales and bolted to the thwarts at each end, thus forming a kind of catamaran; a bridle is then fastened to the bows of the canoes and a line led from the centre of this bridle to the tag line stretched across the river. The meter may be suspended between the canoes or over either side by means of the metering board used on boat sections. The board described in the Annual Report for 1913-14, Plate 9, has been modified to permit of its use with the counting device. This modified form of the metering board is fully illustrated below.



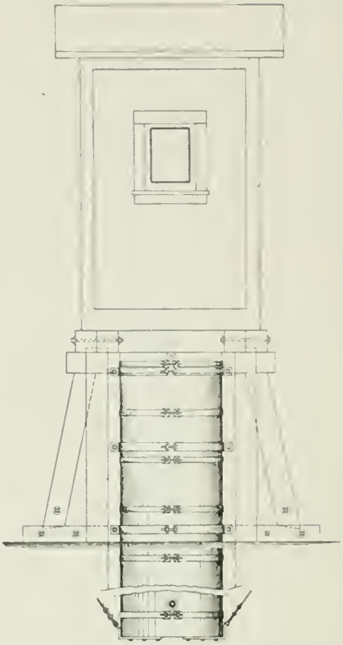
Metering Board for Boat Station.

1. Drum.
2. Suspension cable.
3. Handle of drum.
4. Automatic depth register.
5. Battery.
6. Telephone sounder.
7. Connection plug.

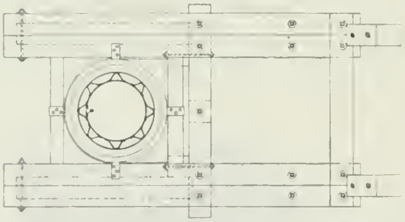
PLATE No 2



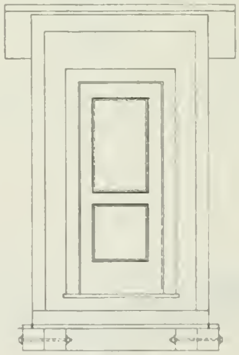
Section on AB



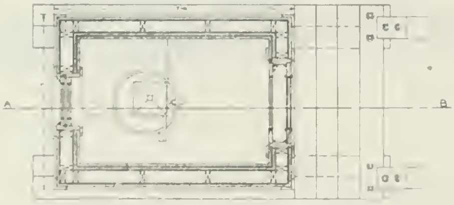
Elevation (River Side)



Plan of Timber Supports & Well in position



Elevation (Land Side)



Plan

DOMINION WATER POWER BRANCH
J. B. CHALLIES C.E. Superintendent

MANITOBA HYDROMETRIC SURVEY

CONSTRUCTION DETAILS OF
TYPICAL AUTOMATIC GAUGE HOUSE

Scale of Feet
1 0 1 2 3 4

July 1916

Winnipeg Manitoba

In making soundings at stations where considerable depths are encountered, considerable difficulty is always experienced in determining within close limits when the bottom is reached by the sounding weights. An attachment has been devised by Mr. Ireland for use with the meter bar in sounding, the meter being removed in such case; by means of the device an electrical contact is made when the weight reaches the bottom, the contact being announced in the ear piece the same as when metering. See illustration of metering board on page 11. Good results have been obtained with this, especially when used in sounding the larger streams, and also at the "Cable carrier" stations where the sag in the cable span formerly influenced the results.

A device which has been found very useful and for which we are indebted to the Engineers of the Water Resources Division, United States Geological Survey, for kindly sending samples and placing the same at our disposal, is used in making connection between the meter bar and the suspension cable. It has been used throughout the work of the last year and has, after a few minor changes, given complete satisfaction.

INSTALLATION OF EQUIPMENT.

AUTOMATIC GAUGES.

During the year a number of automatic gauges have been used. They are of two types, the Gurley Printing, of which four have been installed and preparation made for the fifth, and the Gurley Seven Day Stage Register, of which two were used. The four of the first type have been installed at permanent stations and considerable care has been exercised in erection to ensure as far as possible their operation during the Winter season with minimum attention. (See plate No. 2.) The permanent installations are at the following points:—

The first one was installed in February, 1915, on the public dock at Kenora; the gauge registers the Lake of the Woods levels at that point. The gauge readings are referred to Canadian Geodetic Levels Datum, the Canadian Geodetic Bench Mark on the Kenora Post Office being used for the purpose.

The second was installed in the control dam at the head of the Pinawa Channel. It records the water levels above the control dam, the gauge readings being referred to W.P.S. datum. This gauge was placed in operation in May, 1915.

The third installation is at Slave Falls and will be used for rating the discharge at that point, being placed on the left side of the river about two hundred feet above the metering station. The gauge is referred to W.P.S. datum, a permanent bench mark being placed near the gauge. The gauge began operation in June, 1915.

The fourth automatic gauge was installed at the head of Whitedog falls on the Winnipeg river; by means of this installation it will be possible to rate both the North and South Channels at that point. The datum of the gauge is W.P.S. datum, being tied in to a permanent bench mark placed near the gauge. This gauge was put in operation in August, 1915.

The material for the fifth installation has been purchased and is now at the site. This will be at the Hudson's Bay Post at Lac Seul. As this lake forms one of the largest natural storage basins on the Winnipeg river drainage system, it is considered advisable to install a gauge at the point named.

The two seven day gauges were used in connection with the hydrometric studies of the Nelson river near Manitou rapids. They were only temporarily installed and were removed at the end of the season's work. The zero of each gauge was, however, referred to two permanent bench marks which were tied together by a line of levels, also to the Hudson's Bay Railway datum.

CABLE STATIONS.

During the year two new cable stations were built, one at the head of the Pinawa Channel and the other at the South Channel, Whitedog falls. The station at Slave falls was also overhauled and certain repairs and renewals made.

New cable carrier stations were placed at the North Channel of Whitedog falls on the Winnipeg river and at Stuartburn and Dominion City on the Roseau river. (See plate No. 3 below).

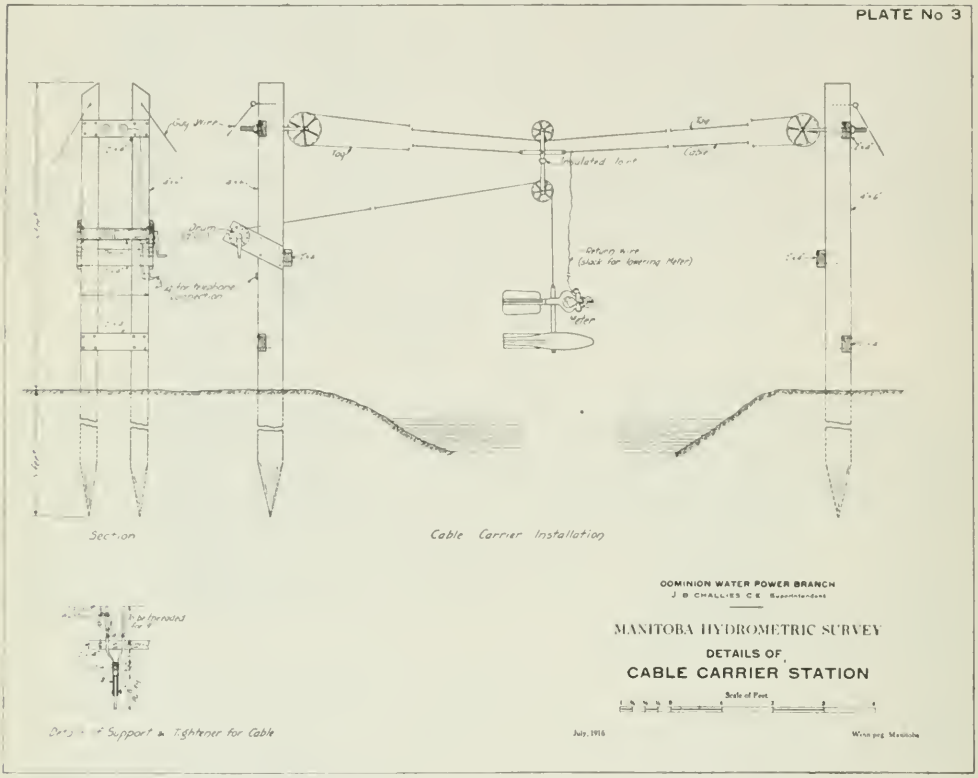


PLATE No 3
Guy Wire
Tag
Insulated Joint
Cable
Drum
Return wire (slack for lowering Meter)
for telephone connection
Meter
Section
Cable Carrier Installation
Support & Tightener for Cable
DOMINION WATER POWER BRANCH
J B CHALLIES C E Superintendent
MANITOBA HYDROMETRIC SURVEY
DETAILS OF
CABLE CARRIER STATION
Scale of Feet
July, 1916
Winnipeg Manitoba

The apparatus at the Bridge Station on the Saskatchewan river at Pas was also overhauled and repaired.

ACKNOWLEDGMENTS.

The Survey is indebted to the officials of a number of corporations for co-operation in obtaining records and for placing the results of various observations made by their own staff at the disposal of the Survey. The officials to whom acknowledgment is due are those of the Winnipeg Electric Street Railway, the Winnipeg Municipal Plant, the Lake of the Woods Milling Company and the Kenora Municipal Plant.

PROGRESS REPORT

OF THE

MANITOBA HYDROMETRIC SURVEY

FOR

THE CALENDAR YEAR, 1915

PART II

HYDROMETRIC DATA

PART II.

HYDROMETRIC DATA.

LAKE OF THE WOODS OUTLETS.

The outflow from the Lake of the Woods into the Winnipeg river below the lake is through several natural and artificial channels. The flow through all these outlets is controlled by the operation of hydraulic plants or the manipulation of dams. The outlets from the lake in order from the east are—Eastern Outlet, completely controlled by the Municipal Power Plant of Kenora; the Western Outlet, upon which has been built the Norman Dam; the head race of Mill "C," Lake of the Woods Milling Co., an artificial outlet; the head race of Mill "A" belonging to the same Company, and also an artificial channel, and last, the artificial head race of the Keewatin Lumber and Manufacturing Co.'s plant which was formed by an old high water channel that discharged into Mink Bay which in turn drains into Darlington Bay,, an arm of the Winnipeg river.

Below the outlets the Winnipeg river is split up into a number of branches, the tail races of Mills "A" and "C," the outlet of Darlington Bay and the Western Outlet forming the West Branch, and river below the Eastern Outlet forming the East Branch. These unite below Old Fort Island to form the main river.

The manipulation and operation of the dams and plants at the various outlets renders it difficult to ascertain the discharge from the Lake of the Woods. In order that correct estimates may be made it has been necessary to establish and operate a number of metering stations and maintain gauges at various points in the district. The location of the metering stations are as follows:—

1. Eastern Outlet, above the Kenora Power House.
2. Western Outlet, Norman Traffic Bridge.
3. Head Race Mill "C."
4. Head Race Mill "A."
5. Head Race, Keewatin Lumber & Manufacturing Co.
6. C.P.R. Culvert, Outlet of Mink Bay.
7. North Tunnel Island Station.

In addition to the records obtained at these regular stations, observations of the discharge at different controlling sections below the outlets have been made from time to time.

EAST BRANCH WINNIPEG RIVER, KENORA POWER HOUSE.

HISTORY.

The discharge of the East Branch, or Eastern Outlet, Lake of the Woods, depends upon the operation of the Kenora Municipal Power Plant. To determine the discharge under these circumstances it was necessary to rate the Power Plant. At first an attempt was made to determine the discharge directly, and to this end a station was established by Mr. S. S. Scovil, June 27, 1912, about one-half mile below the Power House near Old Fort Island; this proved unsatisfactory so a station was established by A. Pirie, October 8, 1913, about one hundred and fifty feet above the Power House in the Eastern Outlet. This section was used to rate the power station.

LOCATION OF SECTION.

The metering station is about one hundred and fifty feet above the Kenora Power House on the Eastern Outlet of the Lake of the Woods. The I.P. is located on the bank and is marked by an iron bolt set in the rock.

RECORDS AVAILABLE.

Daily gauge height readings are available for the head-and tail race of the plant from August 21, 1907, and daily estimates of discharge based upon the load upon the plant are available for a like period.

DRAINAGE AREA.

As in the case of the other outlets of the Lake of the Woods, the drainage area above, for the individual outlets is not significant.

GAUGE.

The tail-race and head-race gauges were established at the Power Plant in 1907, and are the ones used in the records until 1912, when on June 24 and 27, head-and tail race gauges were respectively established by Mr. Scovil, the former being on the upstream side of the timber platform in the head race and the latter two hundred feet below the power house. Both were referred to W.P.S. datum.

CHANNEL.

The channel is permanent, being in solid rock and boulders, is fairly uniform and free from cross eddies. It is straight for fifty feet above the section and one hundred feet below and fairly uniform. All the water passes through the power house except for a small part escaping in the log chute.

DISCHARGE MEASUREMENTS.

Sufficient measurements were made to rate the station under the range in loads and heads occurring, and a rating curve of load-discharges constructed for various heads. A boat station is used for the measurements.

ACCURACY.

Except for conditions due to small loads the rating may be considered good.

Discharge Measurements of East Branch Winnipeg River at Kenora Power House, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 10	S. C. O'Grady.	1,718	79	1,294	1·01	1,059·37	1,305
10	"	1,718	79	1,294	0·99	1,059·37	1,275
10	"	1,718	79	1,294	0·96	1,059·37	1,243
10	"	1,718	79	1,294	0·99	1,059·37	1,285
July 14	C. C. Galloway.	1,374	79	1,360	0·56	1,060·25	762
14	"	1,374	79	1,360	0·61	1,060·25	830
Aug. 18	"	1,374	79	1,308	0·57	1,059·55	745
18	"	1,374	79	1,308	0·59	1,059·55	771
Oct. 15	"	1,496	79	1,244	1·16	1,058·99	1,448
15	"	1,496	79	1,244	1·08	1,058·99	1,348

DAILY GAUGE HEIGHT AND DISCHARGE OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE FOR 1915.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	59·44	843	59·38	1,168	59·46	905	59·37	684	59·42	817	59·72	934
2	59·44	876	59·43	1,187	59·40	1,046	59·38	648	59·52	645	59·64	922
3	59·49	833	59·42	1,031	59·38	1,026	59·36	916	59·43	1,021	59·57	909
4	59·48	845	59·43	1,129	59·39	986	59·13	633	59·51	1,089	59·65	903
5	59·48	837	59·41	1,163	59·36	1.115	59·38	879	59·53	1,092	59·85	922
6	59·40	1,040	59·45	990	59·37	1.006	59·42	875	59·40	1,103	59·50	686
7	59·41	1,083	59·47	728	59·39	678	59·41	880	59·56	907	59·53	851
8	59·43	1,058	59·43	1,158	59·40	1,113	59·41	877	59·15	922	59·34	960
9	59·42	1,027	59·43	1,074	59·37	1,115	59·41	1,016	59·73	650	59·59	927
10	59·47	781	59·44	1,127	59·37	1,098	59·43	896	59·63	659	59·67	937
11	59.46	1,040	59·40	1,004	59·37	931	59.47	633	59.72	675	59·55	907
12	59·46	1,022	59·41	1,138	59·37	925	59·45	847	59·65	784	59·60	903
13	59·47	1,163	59·44	952	59·36	886	59·43	892	59·73	812	59·47	678
14	59·45	1,069	59·50	698	59·40	670	59·41	1,036	59·69	892	59·90	690
15	59·41	1,079	59·47	1,107	59·39	664	59·39	1,049	59·60	899	59·73	695
16	59·40	1,036	59·46	999	59·41	659	59·39	1,071	59·56	660	59·45	703
17	59·48	801	59·42	1,099	59·42	659	59·43	900	59·56	789	59·85	712
18	59·47	1,018	59·46	1,090	59·33	664	59·44	642	59·67	915	59·69	924
19	59·43	1,161	59·43	1,070	59·43	679	59·41	1,085	59·73	1,068	59·75	863
20	59·42	1,181	59·47	973	59·40	687	59·37	1,137	59·70	977	59·92	673
21	59·45	1,216	59·49	689	59·39	674	59·42	1,120	59·65	1,164	60·04	718
22	59·43	1,213	59·44	1,019	59·40	674	59·37	1,127	59·75	904	59·80	740
23	59·45	1,121	59·41	1,091	59·43	671	59·37	1,123	59·83	694	60·14	859
24	59·47	832	59·10	952	59·38	690	59·39	917	59·74	1,124	59·94	902
25	59·43	1,215	59·37	1,091	59·37	967	59·49	660	59·54	972	60·12	716
26	59·44	1,153	59·39	1,110	59·42	967	59·38	1,118	59·73	942	60·05	708
27	59·42	1,259	59·37	963	59·37	795	59·50	1.116	59·83	922	60·20	679
28	59·42	1,252	59·45	683	59·41	679	59·51	1,128	59·73	938	60·32	832
29	59·42	1,220	....	....	59·38	877	59·48	1,102	59·68	882	60·21	927
30	59·42	1,192	....	....	59·38	699	59·42	1,152	59·72	689	60·30	946
31	59·47	738	....	....	59·34	881	......	......	59·71	849	......	......

	July.		August.		September.		October.		November.		December.	
1	60·43	720	59·92	742	59·28	644	58·98	1,151	58·68	1,455	58·80	1,535
2	60·35	978	59·85	1,008	59·27	651	59·11	969	58·68	1,474	58·80	1,542
3	60·32	916	59·88	852	59·35	642	58·93	661	58·78	1,462	58·77	1,554
4	60·28	728	59·82	776	59·28	668	58·58	1,131	58·64	1,503	58·78	1,500
5	60·30	889	59·81	771	59·37	621	59·03	1,377	58·98	1,468	58·85	828
6	60·35	981	59·81	771	59·27	643	58·83	1,399	58·74	1,504	58·78	1,237
7	60·34	934	59·75	859	59·27	636	58·48	1,462	58·68	804	58·83	1,268
8	60·37	996	59·75	992	59·32	679	58·62	1,439	58·74	1,142	58·87	761
9	60·42	1,002	59·79	818	59·23	710	59·15	1,427	58·79	1,062	58·84	1,074
10	60·48	929	59·77	754	59·11	731	59·00	746	59·18	985	58·80	1,537
11	60·52	730	59·82	760	59·10	719	58·85	1,207	58·76	1,421	58·84	1,545
12	60·45	818	59·73	750	59·12	639	59·01	1,421	59·10	929	58·89	1,044
13	60·47	772	59·72	753	58·98	884	58·90	1,433	58·80	1,549	58·84	1,539
14	60·26	788	59·62	747	58·96	932	58·92	1,403	58·81	1,096	58·81	1,578
15	60·41	787	59·62	917	59·21	928	58·98	1,113	58·80	1,557	58·82	1,566
16	60·41	759	59·43	753	59·17	936	58·90	1,421	58·84	1,553	58·84	1,485
17	60·14	989	59·62	748	59·08	951	58·95	732	58·97	1,524	58·84	1,562
18	60·28	722	59·55	758	58·88	947	58·91	1,132	58·93	1,515	58·85	1,578
19	60·22	916	59·55	750	59·13	651	59·08	663	58·61	1,490	58·92	900
20	60·21	994	59·62	755	58·46	1,200	58·88	1,019	58·79	1,538	58·86	1,060
21	60·27	776	59·42	726	58·95	972	58·82	1,422	58·67	1,149	58·87	1,506
22	60·32	751	59·47	679	59·07	1,145	58·80	1,426	58·87	1,184	58·85	1,531
23	60·05	973	59·52	713	58·93	916	58·75	1,415	58·83	1,518	58·82	1,544
24	60·26	754	59·23	705	58·79	1,111	58·89	1,393	58·81	1,509	58·82	851
25	60·24	727	59·14	688	58·91	969	59·07	1,424	58·67	1,460	58·94	769
26	60·15	975	59·40	679	58·71	668	58·64	1,161	58·80	1,512	58·94	713
27	60·13	783	59·55	672	58·95	1,163	59·03	1,420	58·78	1,495	58·89	1,347
28	60·09	1,001	59·39	644	59·02	1,193	58·68	1,440	58·90	844	58·84	1,532
29	60·13	976	59·27	636	58·98	1,207	58·78	1,396	58·77	1,283	58·83	1,554
30	60·08	784	59·43	649	59·00	1,018	58·80	1,419	58·80	1,513	58·92	1,571
31	59·93	1,011	59·38	655			58·94	1,008			58·87	1,564

NOTE.—Gauge heights are those read at the Forebay.

MONTHLY DISCHARGE OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE FOR 1915.

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre feet.
January	1,259	738	1,039			63,900
February	1,187	683	1,017			59,800
March	1,115	659	841			51,700
April	1,152	633	939			55,900
May	1,164	645	886			54,500
June	960	673	824			49,000
July	1,011	720	866			53,200
August	1,008	636	751			46,200
September	1,145	621	859			51,100
October	1,462	661	1,317			81,000
November	1,557	804	1,360			80,900
December	1,578	743	1,329			81,700
The Year	1,578	621	1,002			728,900

WESTERN OUTLET AT NORMAN TRAFFIC BRIDGE

HISTORY.

Station was established on June 5, 1912 by S.S. Scovil.

LOCATION OF SECTION.

The section is located on the downstream side of the Norman Traffic Bridge which spans the western outlet of the Lake of the Woods about two miles west of Kenora on the highway leading from Kenora to Keewatin. The Initial Point is marked on the wooden hand rail at the west end of the bridge, the meterings being taken from the deck.

RECORDS AVAILABLE.

Estimates of daily discharge are available for this station from May 1, 1913, and are based upon gauge readings taken at the D.P.W. Forebay gauge, Norman Dam, from May 1 to August 25, 1913, and from August 26, 1913 on, the gauge heights are those recorded by the Manitoba Hydrometric Survey gauge above the Norman Dam.

DRAINAGE AREA.

The drainage area above this section is 26,400 square miles, but owing to the fact that there are several other outlets of the Lake of the Woods this drainage area should not be used in computing run-off.

GAUGE.

When the station was first established a reference point was marked on the northeast corner of the west pier of the bridge to which water levels at the time of metering were referred. This was later replaced by a vertical staff gauge which was referred to W.P.S. datum.

Owing to the fact that the discharge past this section depends entirely upon the operation of the Norman Dam, the discharge measurements have been referred to the gauge height at that point, and daily discharges are also referred to the same gauge. Two gauges were established above the Norman Dam, the first being that of the Ontario D.P.W. gauge which was used until the 25 of August, 1913. On the 26 of August, 1913, a vertical staff gauge was established by the Manitoba Hydrometric Survey which was referred to the W.P.S. datum.

CHANNEL.

There is but one channel for all stages of the river, the average depth over the section being approximately forty feet under normal conditions. The bed of the river is loose rock and boulders but is not subject to appreciable change. The velocity of the section is fairly high and some eddies are formed due to the section being located at the apex of a curve.

DISCHARGE MEASUREMENTS.

287 discharge measurements have been made at this station, but owing to the fact that the water at this point is practically at lake level, the range in stage has not been great, amounting to 2.2 feet.

ACCURACY.

The Norman dam which is located about four thousand feet below the station forms the control and the discharge is therefore dependent upon the manipulation of that dam; considerable range in discharge may occur for the same gauge height recorded at the section.

DISCHARGE MEASUREMENTS OF WESTERN OUTLET, LAKE OF THE WOODS AT NORMAN TRAFFIC BRIDGE, 1915

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Logs out of dam.
Jan. 8.	S. C. O'Grady	1,861	212	5,116	1·47	59·40	7,535	10
8.	"	1,861	212	5,116	1·47	59·40	7,501	10
14.	"	1,861	212	5,118	1·50	59·41	7,665	10
22.	"	1,861	212	5,118	1·51	59·41	7,713	10
22	"	1,861	212	5,118	1·50	59·41	7,688	10
Feb. 6.	"	1,861	212	5,122	1·45	59·32	7,434	10
16.	"	1,861	212	5,118	1·51	59·41	7,725	10
16	"	1,861	212	5,118	1·49	59·41	7,621	10
Mar. 9.	"	1,861	212	5,105	1·45	59·35	7,418	10
9.	"	1,861	212	5,105	1·48	59·35	7,578	10
18	"	1,861	212	5,091	1·45	59·28	7,379	10
18.	"	1,861	212	5,091	1·47	59·28	7,471	10
April 6.	"	1,861	212	5,114	1·46	59·39	7,459	10 (Removing
6.	"	1,861	212	5,114	1·52	59·39	7,768	10 logs Apr. 6-7.)
10.	"	1,861	212	5,072	2·73	59·19	13,824	42
10.	"	1,861	212	5,072	2·59	59·19	13,128	42
22.	C. C. Galloway	1,861	205	5,044	2·58	59·11	13,025	42
22	"	1,861	205	5,044	2·63	59·11	13,258	42
May 11.	"	1,861	212	5,119	2·74	59·41	14,028	42 (Removing
11.	"	1,861	212	5,122	3·00	59·43	13,300	42 logs May 17-20).
18	F. S. Smith	1,861	212	5,081	3·48	59·24	17,660	134
18.	"	1,861	212	5,072	3·53	59·19	17,907	134
18.	"	1,861	212	5,056	3·80	59·11	19,226	134
19.	"	1,861	211	5,037	4·14	59·03	20,863	134
19.	"	1,861	211	5,029	4·16	59·01	20,907	134
20.	"	1,861	211	5,007	4·56	58·88	22,804	134
21.	"	1,861	211	5,000	4·50	58·85	22,481	(Replacing logs
21.	"	1,861	211	5,000	4·36	58·85	21,778	May 21-22).
21.	"	1,861	211	5,002	4·31	58·86	21,554	
31.	C. C. Galloway	1,861	212	5,076	3·41	59·21	17,325	83
31.	"	1,861	212	5,076	3·51	59·21	17,833	83
June 7.	"	1,861	211	5,048	3·45	59·08	17,435	83
7.	"	1,861	211	5,048	3·43	59·08	17,397	83
25.	"	1,861	212	5,151	3·62	59·57	18,659	83
25.	"	1,861	212	5,140	3·64	59·52	18,706	83 101-June 29
30	"	1,861	212	5,147	4·34	59·56	22,340	115 June 30.
July 5.	"	1,374	212	5,171	4·51	59·67	23,323	115
5.	"	1,374	212	5,171	4·53	59·67	23,427	115
12.	"	1,374	212	5,182	4·46	59·72	23,111	115
12	"	1,374	212	5,182	4·58	59·72	23,733	115
16.	"	1,374	212	5,173	4·54	59·68	23,488	115
16.	"	1,374	212	5,178	4·53	59·70	23,345	115
22.	"	1,374	212	5,157	4·43	59·60	22,844	115
22.	"	1,374	212	5,157	4·42	59·60	22,794	115 126-July 24.
28.	"	1,374	212	5,089	4·81	59·27	24,478	142 July 26.
28.	"	1,374	212	5,089	4·85	59·27	24,681	142
Aug. 2.	"	1,374	211	5,031	4·72	59·00	23,746	142
2.	"	1,374	211	5,031	4·69	59·00	23,597	142
5	"	1,374	211	5,017	4·66	58·93	23,379	142
5	"	1,374	211	5,017	4·65	58·93	23,319	142 119-Aug. 9.
11	"	1,374	211	5,046	4·19	59·07	21,142	119
16.	"	1,374	205	4,946	4·36	58·63	21,567	130 130-Aug. 13.
16.	"	1,374	205	4,946	4·38	58·63	21,576	130 122-Aug. 18.
27	"	1,374	212	5,107	2·25	59·36	11,492	20 111-Aug. 19.
27.	"	1,374	212	5,097	2·18	59·31	11,119	20 82-Aug. 20.
30.	"	1,374	212	5,093	2·17	59·29	11,052	20 49-Aug. 21.
30.	"	1,374	212	5,099	2·19	59·32	11,167	20 20-Aug. 25.
Sept. 3	"	1,374	211	5,052	2·13	59·10	10,760	20
3	"	1,374	211	5,052	2·14	59·10	10,811	20
8.	"	1,374	211	5,058	2·14	59·14	10,824	20
8	"	1,374	211	5,058	2·18	59·14	11,027	20
12	"	1,374	211	5,004	2·06	58·87	10,339	20
13	"	1,374	211	5,004	2·08	58·87	10,409	20

DISCHARGE MEASUREMENTS OF WESTERN OUTLET, LAKE OF THE WOODS AT NORMAN TRAFFIC BRIDGE, 1915—Continued.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	Logs out of dam.
Sept. 17.	C. C. Galloway...	1,374	211	5,031	2·05	59·00	10,314	20
22.	“ ...	1,374	211	5,031	2·14	59·00	10,767	20
22.	“ .	1,374	211	5,031	2·07	59·00	10,411	20
27.	“ ..	1,374	211	5,002	2·00	58·86	10,005	20
Oct. 1.	“ .	1,374	211	5,023	1·42	58·96	7,148	8 Sept. 30.
1.	“ .	1,374	211	5,023	1·42	58·96	7,128	8
4.	“ .	1,374	205	4,938	1·37	58·59	6,746	8
4.	“ .	1,374	205	4,938	1·37	58·59	6,805	8
8.	“ .	1,496	205	4,959	1·45	58·70	7,218	8
8.	“	1,496	205	4,971	1·40	58·75	6,757	8
13.	“ .	1,496	205	5,007	1·41	58·88	7,074	8
13.	“ .	1,496	205	5,007	1·45	58·88	7,246	8
18.	“ ..	1,496	205	5,019	1·41	58·94	7,079	8
18.	“ ..	1,496	205	5,019	1·45	58·94	7,289	8
22.	“ ..	1,496	205	4,982	1·40	58·76	6,967	8
22.	“ ..	1,496	205	4,982	1·42	58·76	7,061	8
27.	“ ..	1,496	205	5,085	1·49	59·26	7,598	8
27.	“ ..	1,435	205	5,085	1·41	59·27	7,170	8
Nov. 3.	“ ..	1,435	205	4,994	1·38	58·82	6,932	8
3.	“ ...	1,435	205	4,994	1·40	58·82	6,988	8
10.	“ ...	1,435	205	5,049	1·41	59·04	7,120	8
10.	“ ...	1,435	205	5,049	1·42	59·04	7,170	8
13.	“ ...	1,435	205	4,998	1·34	58·84	6,678	8
13.	“ ..	1,435	205	4,998	1·36	58·84	6,778	8
15.	“ ...	1,435	205	4,992	1·34	58·81	6,689	8
15.	“	1,435	205	4,992	1·39	58·81	6,939	8
22.	“ ...	1,435	205	4,992	1·34	58·82	6,690	8
22.	“ .	1,435	205	4,992	1·36	58·82	6,789	8
26.	“ ..	1,435	205	4,990	1·39	58·80	6,936	8
26.	“	1,435	205	4,990	1·38	58·80	6,886	8
Dec. 1.	“ ..	1,435	205	4,983	1·34	58·81	6,660	8
1.	“ ..	1,435	205	4,983	1·32	58·81	6,586	8
6.	“ .	1,435	205	4,979	1·33	58·79	6,630	8
6.	“ ..	1,435	205	4,979	1·33	58·79	6,630	8
10.	“ .	2,019	205	4,981	1·33	58·80	6,625	8
10.	“	2,019	205	4,981	1·33	58·80	6,625	8
15.	“	2,019	205	4,979	1·37	58·79	6,812	8
15.	“ .	2,019	205	4,979	1·37	58·79	6,830	8
21.	“ .	2,019	205	4,993	1·38	58·86	6,931	8
24.	“	2,019	205	4,997	1·37	58·88	6,857	8
24.	“	2,019	205	4,997	1·37	58·88	6,835	8
28.	“	2,019	205	4,995	1·35	58·87	6,743	8
28	“	2,019	205	4,995	1·34	58·87	6,694	8

DAILY GAUGE HEIGHT AND DISCHARGE OF WESTERN OUTLET, LAKE OF THE WOODS AT NORMAN TRAFFIC BRIDGE FOR 1915.

[Drainage area 26,400 square miles.]

Day.	January		February		March		April.		May		June	
	Gauge Height.	Discharge.	Gauge Height.	Discharge	Gauge Height	Discharge	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft	Feet.	Sec. ft	Feet.	Sec. ft	Feet.	Sec. ft.
1	59·10	7,545	59·08	7,613	59·00	7,522	58·90	7,588	58·25	13,428	57·50	17,492
2	59·06	7,499	59·10	7,636	59·05	7,579	58·90	7,343	58·25	14,033	57·50	17,448
3	59·05	7,488	59·07	7,602	59·03	7,556	58·90	7,409	58·27	13,456	57·50	17,345
4	59·01	7,442	59·10	7,636	59·00	7,522	58·97	7,548	58·30	13,573	57·48	17,184
5	59·00	7,431	59·12	7,661	59·00	7,522	59·02	7,597	58·30	13,509	57·45	17,178
6	59·00	7,431	59·15	7,698	59·00	7,522	59·10	7,664	58·40	13,615	57·41	17,023
7	59·03	7,465	59·13	7,673	59·00	7,522	59·00	9,378	58·45	13,586	57·40	17,025
8	59·11	7,645	59·10	7,636	59·02	7,545	58·25	12,376	58·50	13,623	57·40	16,768
9	59·09	7,622	59·15	7,698	59·08	7,518	58·25	12,842	58·50	14,036	57·40	17,045
10	59·10	7,633	59·12	7,661	59·03	7,461	58·30	13,302	58·46	13,846	57·45	17,324
11	59·11	7,645	59·10	7,636	59·00	7,427	58·22	13,289	58·40	14,076	57·50	17,323
12	59·11	7,645	59·10	7,636	59·00	7,427	58·25	13,141	58·45	14,117	57·55	17,402
13	59·13	7,670	59·10	7,636	59·00	7,427	58·25	13,233	58·50	14,142	57·55	17,570
14	59·05	7,625	59·10	7,636	59·00	7,427	58·25	13,322	58·48	14,177	57·60	17,573
15	59·10	7,682	59·10	7,636	58·92	7,343	58·20	13,359	58·45	14,150	57·60	17,629
16	59·10	7,682	59·12	7,661	58·95	7,374	58·20	13,340	58·44	14,584	57·60	17,669
17	59·10	7,682	59·15	7,698	58·95	7,374	58·20	13,363	58·37	15,216	57·80	17,560
18	59·10	7,682	59·15	7,698	58·95	7,374	58·20	13,808	57·50	18,284	57·90	17,691
19	59·10	7,682	59·15	7,698	58·95	7,449	58·20	13,424	56·25	20,949	57·60	18,382
20	59·10	7,682	59·12	7,661	58·95	7,449	58·25	13,448	55·90	22,760	57·61	18,288
21	59·05	7,625	59·11	7,648	58·95	7,449	58·30	13,577	56·50	21,702	57·65	18,370
22	59·02	7,617	59·11	7,648	58·95	7,449	58·32	13,725	56·90	19,866	57·55	18,528
23	59·02	7,617	59·10	7,636	58·95	7,449	58·35	13,858	57·57	19,178	57·65	18,600
24	59·00	7,594	59·12	7,661	58·95	7,449	58·37	13,769	57·52	18,719	57·55	18,632
25	59·06	7,662	59·12	7,661	58·95	7,449	58·39	14,101	57·50	18,362	57·55	18,312
26	59·10	7,708	59·12	7,661	58·95	7,449	58·35	13,471	57·60	17,965	57·68	18,181
27	59·15	7,770	59·12	7,661	58·95	7,449	58·28	13,571	57·60	17,755	57·80	18,392
28	59·10	7,708	59·00	7,522	58·95	7,449	58·25	13,495	57·50	17,662	57·96	18,269
29	59·10	7,708	....	....	59·02	7,525	58·20	13,631	57·50	17,420	57·25	19,236
30	59·10	7,708	......	......	59·05	7,559	58·25	13,468	57·50	17,245	56·85	20,651
31	59·09	7,697	...	...	59·05	7,559	...		57·50	17,444	...	

Day.	July		August.		September.		October.		November.		December	
1	56·85	21,978	55·70	23,269	58·32	10,543	58·70	8,522	58·68	6,846	58·56	6,762
2	56·85	22,465	55·70	23,229	58·38	10,781	58·87	7,551	58·62	6,923	58·56	6,821
3	56·85	23,013	55·70	23,222	58·45	10,826	59·00	7,960	58·59	6,920	58·56	6,830
4	56·81	23,010	55·70	23,251	58·50	10,792	59·00	7,382	58·63	6,771	58·56	6,805
5	56·86	23,131	55·68	23,177	58·50	11,058	59·00	7,550	58·68	7,025	...	7,645
6	56·90	23,219	55·65	23,142	58·50	10,599	58·95	7,371	58·72	6,948	...	6,635
7	56·95	22,857	55·65	23,109	58·48	10,546	58·90	7,546	58·75	6,889	...	6,716
8	56·95	22,922	55·57	23,124	58·46	10,462	58·83	7,515	58·77	6,886	...	6,636
9	56·98	23,294	55·98	23,100	58·48	10,426	58·76	7,471	58·78	6,911	58·56	6,771
10	56·98	23,253	56·20	21,593	58·50	10,385	58·73	7,516	58·78	7,621	58·54	6,879
11	56·99	23,382	56·40	21,231	58·52	10,356	58·69	7,280	58·75	7,260	58·54	6,855
12	56·99	23,071	56·35	21,108	58·55	10,486	58·65	7,382	58·61	7,264	58·57	7,005
13	57·00	23,043	56·25	21,403	58·55	10,108	58·62	7,411	58·60	7,129	58·58	6,973
14	57·00	23,028	56·10	23,690	58·45	10,169	58·65	7,408	58·58	6,943	58·58	7,003
15	57·03	22,986	56·00	21,704	58·33	10,306	58·65	7,373	58·57	6,968	58·56	7,016
16	56·93	23,059	55·87	21,334	58·20	10,301	58·63	7,186	58·58	6,920	58·61	7,032
17	56·90	23,015	56·10	21,142	58·25	10,273	58·60	7,337	58·58	6,906	58·63	6,920
18	56·87	23,022	56·20	20,262	58·28	9,913	58·57	7,204	58·56	6,903	58·63	6,952
19	56·90	22,793	56·30	18,973	58·31	10,092	58·52	7,311	58·56	6,830	58·63	6,889
20	56·90	22,661	56·50	15,998	58·35	9,796	58·18	7,302	58·56	6,776	58·62	6,879
21	56·90	22,710	57·72	13,011	58·35	9,987	58·45	7,171	58·56	6,702	58·61	7,007
22	56·94	22,591	58·28	13,116	58·40	10,177	58·49	7,037	58·55	6,731	58·61	6,970
23	56·95	22,521	58·47	13,078	58·10	10,086	58·55	6,920	58·54	6,618	58·61	6,978
24	56·60	22,946	58·55	13,018	58·12	10,031	58·64	7,092	58·55	6,693	58·63	6,953
25	56·26	23,390	58·58	12,826	58·15	9,943	58·71	7,002	58·55	6,743	58·55	7,458
26	55·90	23,672	58·60	11,148	58·19	10,031	58·77	6,676	58·56	6,800	58·65	7,204
27	55·78	23,916	58·55	11,033	58·27	9,834	58·78	6,767	58·56	6,807	58·66	6,824
28	55·75	24,215	58·50	10,912	58·35	9,931	58·77	6,809	58·56	6,695	58·61	6,909
29	55·73	24,254	58·42	10,934	58·48	9,810	55·76	6,898	58·56	6,695	58·61	6,942
30	55·70	24,200	58·34	10,823	58·58	9,283	55·75	6,932	58·56	6,694	58·63	6,972
31	55·70	23,669	58·25	10,855	...	...	55·75	7,090			58·66	7,057

NOTE.—Gauge heights are those read on the D.P.W. gauge at the Forebay, Norman Dam.

Monthly Discharge of Western Outlet, Lake of the Woods at Norman Traffic Bridge for 1915.

[Drainage area 26,400 square miles.]

MONTH	Discharge in Second-Feet				Run Off	
	Maximum.	Minimum.	Mean	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet
January	7,770	7,431	7,622	....	....	468,700
February	7,698	7,522	7,650	....	....	424,900
March	7,579	7,427	7,470	....	....	459,300
April	14,101	7,343	12,115	....	....	720,900
May	21,702	13,428	16,209	....	....	996,700
June	20,051	16,768	17,850	....	....	1,062,200
July	24,254	21,978	23,138	....	....	1,422,700
August	23,690	10,823	18,317	....	....	1,126,240
September	11,058	9,283	10,244	....	....	609,500
October	8,522	6,676	7,290	....	....	448,200
November	7,264	6,618	6,882	....	....	409,500
December	7,645	6,635	6,945	....	....	427,000
The Year	24,254	6,618	11,811	....	....	8,575,800

Note.—Discharge per square mile and run-off depth in inches omitted. The outlet is one of several from the Lake of the Woods.

MILL "A" HEADRACE, KEEWATIN.

HISTORY.

The station in the Headrace Mill "A" was established by Mr. S. S. Scovil, December 23rd, 1912. This channel has formed one of the outlets of the Lake of the Woods since the Mill was built in 1887. A gauge in the Tailrace was operated from May, 1896, until June, 1912, when it was discontinued.

LOCATION OF SECTION.

The section as first located in the Headrace of Mill "A" was on the downstream side of the foot bridge across the channel. Later it was changed to a position just above the intake racks of the power house in the headrace Mill "A" Lake of the Woods Milling Co., Keewatin, Ont.

RECORDS AVAILABLE.

Intermittent gauge readings in the tailrace from 1896-1912 and from 1913 daily discharge records based upon meterings, head-and tail-gauge readings and loads on the Mill are available.

DRAINAGE AREA.

Total drainage area above the Lake of the Woods outlets is 26,400 square miles.

GAUGE.

A staff gauge has been placed on the metering section close to the right side of the channel. This gauge is referred to a W.P.S. B.M. located about 20 feet west of the gauge.

CHANNEL.

The entrance to the racks is uniform and the section is well situated to avoid eddies of entrance, the stream line being generally perpendicular to the section.

DISCHARGE MEASUREMENTS.

A number of meterings have been made to determine the discharge for different gate openings and head so that the daily discharge may be arrived at. They are made from the rack structure.

ACCURACY.

The records are reliable owing to the conditions controlling the discharge, i.e., gate opening, head, etc., being easily observed.

DISCHARGE MEASUREMENTS OF MILL "A" FLUME NO. 1 AT HEADRACE, LAKE OF THE WOODS MILLING CO., 1915

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 12	C. C. Galloway	1,718	15	183	1·41	59·20	258
17	S. C. O'Grady	1,718	15	188	0·28	59·53	53
17	"	1,718	15	188	0·32	59·53	60
17	"	1,718	15	188	0·34	59·53	63
17	"	1,718	15	188	0·34	59·53	64
Mar. 5	"	1,718	15	185	0·82	59·29	151
7	"	1,718	15	187	0·29	59·44	55
7	"	1,718	15	187	0·29	59·44	54
15	C. C. Galloway	1,718	15	186	1·05	59·39	196
15	"	1,718	15	186	1·12	59·39	208
June 9	"	1,718	15	187	1·47	59·45	275
9	"	1,718	15	187	1·49	59·45	280
July 26	"	1,374	15	198	1·08	60·19	215
26	"	1,374	15	198	1·10	60·19	218
Aug. 9	"	1,374	15	192	1·54	59·76	294
9	"	1,374	15	192	1·63	59·76	312
Sept. 24	"	1,374	15	174	1·54	58·61	269
24	"	1,374	15	174	1·51	58·61	264
Oct. 29	"	1,435	15	173	1·45	58·53	251
29	"	1,435	15	173	1·58	58·53	274
Nov. 24	"	1,435	15	173	1·74	58·50	301
24	"	1,435	15	173	1·70	58·50	294
Dec. 18	"	2,019	15	173	1·71	58·53	296
18	"	2,019	15	173	1·70	58·53	295

DISCHARGE MEASUREMENTS OF MILL "A" FLUME NO.2 AT HEADRACE, LAKE OF THE WOODS MILLING CO., 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Apr. 26	C. C. Galloway	1,718	38	610	1·17	59·24	713
26	"	1,718	38	610	1·22	59·24	745
June 9	"	1,718	38	601	1·02	59·45	616
9	"	1,718	38	601	1·04	59·45	628
Sept. 20	"	1,374	38	553	1·20	58·13	666
20	"	1,374	38	553	1·19	58·13	651
Oct. 29	"	1,435	38	568	1·17	58·53	665
29	"	1,435	38	568	1·17	58·53	665
Nov. 17	"	1,435	38	573	1·12	58·68	642
17	"	1,435	38	573	1·15	58·68	659
Dec. 18	"	2,019	38	568	1·29	58·53	733
18	"	2,019	38	568	1·22	58·53	693

MILL "C" HEADRACE, KEEWATIN.

HISTORY.

The station was established on July17, 1912, by Mr. S. S. Scovil, when the first metering was taken by this Survey.

LOCATION OF SECTION.

The section is located about five feet upstream from the racks in the head race of Mill "C," Lake of the Woods Milling Co., leading from Portage Bay, an arm of Lake of theWoods at Keewatin, Ont. The initial point is marked on the east bank of the channel above the racks.

RECORDS AVAILABLE.

The records of discharge are based upon meterings and gauge heights in the head and tail race and also depend upon the load on the Mill. The daily discharges through the Mill are available for 1912-13-14-15.

DRAINAGE AREA.

This channel forms one of the outlets of the Lake of the Woods, and in consequence the drainage area above has no particular significance. It is however 26,400 square miles.

GAUGE.

The gauge is a vertical staff gauge placed on the east side of the channel about ten feet upstream from the racks. The zero of the gauge is referred to W.P.S. datum, the reference B.M. being a point on the top of the flume.

CHANNEL.

The channel is rectangular, cut in solid rock and has a normal depth of twelve feet. It is straight for about fifteen feet above the section.

DISCHARGE MEASUREMENTS.

The meterings are made from a small bridge spanning the channel and have been taken periodically from July 17, 1912, the range in stage covered being about 2½ feet.

ACCURACY.

The station gives good records but the daily discharge depends upon the gate openings on the turbines so that after rating the station to these, the records are reliable.

DISCHARGE MEASUREMENTS OF MILL "C" AT HEADRACE, LAKE OF THE WOODS MILLING CO., 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec. ft.
Feb. 17	C. C. Galloway	1,718	42	526	1·28	59·43	673
17	"	1,718	42	526	1·28	59·43	674
21	"	1,718	42	525	1·43	59·40	750
27	"	1,718	42	525	1·37	59·40	722
Mar. 16	"	1,718	42	525	1·21	59·38	637
June 23	"	1,718	42	545	1·38	58·96	854
23	"	1,718	42	545	1·54	58·91	840
24	"	1,718	42	550	1·38	60·02	759
24	"	1,718	42	550	1·40	60·02	768
July 20	"	1,374	42	559	1·19	60·25	665
20	"	1,374	42	559	1·20	60·25	671
Aug. 13	"	1,374	42	536	1·30	59·67	697
13	"	1,374	42	536	1·29	59·67	691
Sept. 14	"	1,374	42	506	1·28	58·93	648
14	"	1,374	42	506	1·23	58·93	622
Oct. 20	"	1,496	42	502	1·71	58·84	860
20	"	1,496	42	502	1·64	58·84	822
Nov. 11	"	1,435	42	500	1·74	58·79	870
11	"	1,435	42	502	1·74	58·84	874
Dec. 13	"	2,019	42	501	1·86	58·81	932
13	"	2,019	42	504	1·88	58·81	947

KEEWATIN LUMBER & MANUFACTURING CO'S HEADRACE, KEEWATIN, ONT.

HISTORY.

This channel forms one of the outlets of the Lake of the Woods. It was created and used in connection with the above Company's mill, the discharge being controlled by the headgates. After the mill was burned in 1903 these fell into disrepair and leakage occurred; to ascertain this a station was established on December 13, 1913, by S. C. O'Grady and has since been operated.

LOCATION OF SECTION.

The metering section is on the upstream side of the bridge crossing the channel 300 feet above the power house and east of the headgates at the K.L. & M. Co.'s. headrace. The I.P. is a notch cut in the plank floor at the north end of the bridge and marked "0+00."

RECORDS AVAILABLE.

The daily discharge records are available at this point since the establishment of the station in December, 1913.

GAUGE.

There is no gauge at this point, but the meterings are referred to the lake gauge at the Keewatin bridge where daily records are available.

CHANNEL.

The channel is fairly permanent, composed of clay and rock. It is straight for 150 feet above and 100 feet below the section. The current is not swift and depends upon the leakage at the gates.

DISCHARGE MEASUREMENTS.

Discharge measurements are taken frequently to check the leakage through the headgates, and as this control is fairly permanent the discharge depends largely upon the lake stage. No curve has been plotted for the station but the daily estimated discharge is based upon the meterings. The measurements are made from the bridge.

ACCURACY.

The accuracy may be considered good.

DISCHARGE MEASUREMENTS OF HEADRACE, OLD K.L. & M. CO. AT 2ND BRIDGE, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	Lake Gauge.
Jan. 4.	C. C. Galloway..	1,718	30	193	0·88	—6·20	171	99·74
4	"	1,718	30	193	0·82	—6·20	158	99·74
April 14	"	1,718	30	187	0·92	—6·42	172	99·61
14.	"	1,718	30	187	0·92	—6·42	173	99·61
May 18.	M. S. Madden	1,469	32	186	0·91	—6·85	169	99·95
June 18.	C. C. Galloway	1,718	29	163	1·09	—7·10	179	99·98
18.	"	1,718	29	163	1·09	—7·10	179	99·98
July 7.	"	1,374	30	185	1·17	—6·45	216	100·65
7	"	1,374	30	185	1·17	—6·45	216	100·65
7	"	1,374	30	191	1·18	—6·45	225	100·65
Aug. 13.	"	1,374	29	162	1·22	—7·40	198	99·92
13	"	1,374	29	162	1·22	—7·40	198	99·92
Sept. 15	"	1,374	29	157	1·19	—7·65	186	99·57
15	"	1,374	29	157	1·25	—7·65	196	99·57
Oct. 20	"	1,496	29	151	1·14	—7·80	173	99·22
20	"	1,496	29	151	1·11	—7·80	168	99·22
Nov. 17.	"	1,435	29	152	1·02	—7·77	155	99·24
17.	"	1,435	29	152	1·05	—7·77	160	99·24
Dec. 17.	"	2,019	29	152	1·04	—7·75	159	99·14
17	"	2,019	29	152	1·01	—7·75	154	99·14

Daily Gauge Height and Discharge of Headrace, K.L. & M. Co. Near 2nd Bridge for 1915.

[Drainage area 26,400 square miles.]

Day.	January		February		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	99·74	175	99·65	165	99·70	175	99·61	175	99·67	122	99·95	170
2	99·69	170	99·67	165	99·67	165	99·62	175	99·76	140	99·88	160
3	99·74	180	99·67	165	99·68	165	99·61	175	99·60	113	99·84	155
4	99·74	180	99·66	165	99·64	165	99·60	170	99·75	137	99·90	160
5	99·68	170	99·68	170	99·61	160	99·63	175	99·77	141	100·12	195
6	99·69	170	99·69	170	99·60	160	99·65	180	99·64	119	99·75	135
7	99·67	170	99·75	180	99·67	165	99·67	180	99·82	148	99·75	135
8	99·67	170	99·75	180	99·69	175	99·67	180	99·39	80	99·65	120
9	99·67	170	99·71	175	99·65	165	99·69	180	99·97	175	99·85	155
10	99·75	180	99·68	170	99·65	165	99·70	185	99·86	155	99·94	170
11	99·71	170	99·67	165	99·65	165	99·68	180	99·94	169	99·82	150
12	99·68	170	99·67	165	99·65	165	99·70	185	99·88	158	99·88	160
13	99·71	170	99·67	165	99·62	160	99·65	180	99·95	170	99·62	115
14	99·66	165	99·72	175	99·64	165	99·61	175	99·94	169	100·08	195
15	99·62	160	99·75	180	99·63	160	99·62	175	99·85	152	99·90	160
16	99·61	160	99·67	165	99·62	160	99·67	180	99·75	137	99·67	120
17	99·70	170	99·68	170	99·67	165	99·65	180	99·85	152	100.08	195
18	99·75	180	99·70	170	99·58	155	99·70	185	99·95	170	99·98	175
19	99·67	170	99·69	170	99·62	160	99·70	185	99·97	175	100·02	180
20	99·68	170	99·69	170	99·61	160	99·63	175	99·93	165	100·25	225
21	99·71	170	99·75	180	99·65	165	99·63	175	99·93	165	100·28	230
22	99·69	170	99·75	180	99·65	165	99·61	175	100.00	177	100·02	180
23	99·71	170	99·67	165	99·62	160	99·62	175	100·07	90	100·25	225
24	99·75	180	99·65	165	99·65	165	99·70	180	99·98	175	100·23	220
25	99·75	180	99·65	165	99·61	160	99·80	205	99·82	148	100·32	235
26	99·68	170	99·65	165	99·63	160	99·73	185	99·98	175	100·25	225
27	99·70	170	99·66	165	99·61	160	99·75	195	100·09	198	100·48	265
28	99·65	165	99·70	170	99·63	160	99·75	195	99·98	175	100·53	270
29	99·67	170	....	......	99·65	165	99·68	180	99·93	165	100·45	260
30	99·67	170	....	......	99·61	160	99·68	180	99·94	169	100·57	280
31	99·67	170	....	......	99·61	160	....	....	99·93	165	....	..

	July.		August.		September.		October.		November.		December	
1	100·63	215	100·14	215	99·52	187	99·28	180	98·95	110	99·10	146
2	100·62	215	100·13	212	99·51	187	99·37	196	98·97	112	99·13	151
3	100·61	215	100·17	217	99·60	200	99·15	160	99·10	132	99·08	145
4	100·47	195	100·06	202	99·50	185	98·85	115	98·95	110	99·08	145
5	100·53	200	100·04	200	99·60	200	99·27	178	99·20	147	99·13	151
6	100·65	225	100·03	200	99·50	185	99·06	146	99·05	125	99·08	145
7	100·65	225	99·98	190	99·45	176	98·75	100	98·93	107	99·12	150
8	100·62	215	100·00	192	99·58	197	98·87	120	99·05	125	99·10	146
9	100·68	230	100·01	192	99·47	180	99·40	200	99·05	125	99·13	151
10	100·73	235	100·00	192	99·34	160	99·20	167	99·37	172	99·10	146
11	100·73	235	100·02	197	99·32	155	99·14	158	99·02	120	99·12	150
12	100·68	230	99·93	180	99·46	178	99·29	182	99·32	165	99·13	151
13	100·69	230	99·92	180	99·30	153	99·18	165	99·10	133	99·15	154
14	100·50	195	99·85	167	99·22	140	99·18	165	99·05	125	99·10	146
15	100·60	215	99·80	160	99·43	172	99·26	175	99·10	133	99·12	150
16	100·60	215	99·65	137	99·45	176	99·18	165	99·13	136	99·15	154
17	100·41	175	99·80	160	99·31	155	99·21	167	99·20	147	99·15	154
18	100·53	200	99·78	158	99·14	130	99·18	165	99·20	147	99·15	154
19	100·50	195	99·70	145	99·39	167	99·28	181	98·90	103	99·17	155
20	100·47	195	99·69	145	98·68	63	99·10	152	99·10	133	99·17	155
21	100·49	195	99·61	132	99·22	140	99·11	153	98·90	103	99·17	155
22	100·53	200	99·68	144	99·34	160	99·10	152	99·14	138	99·17	155
23	100·37	170	99·75	152	99·21	140	99·05	145	99·10	133	99·17	155
24	100·44	185	99·45	105	99·10	124	99·18	165	99·10	133	99·17	155
25	100·45	185	99·41	100	99·19	137	99·25	175	99·00	117	99·20	161
26	100·41	175	99·61	132	99·00	108	98·92	125	99·10	133	99·20	161
27	100·35	165	99·76	152	99·22	140	99·32	185	99·08	130	99·20	161
28	100·35	165	99·63	135	99·30	153	98·95	130	99·15	140	99·16	155
29	100·40	175	99·48	112	99·27	150	99·07	147	99·05	125	99·16	155
30	100·31	160	99·66	138	99·27	150	99·08	148	99·00	133	99·15	155
31	100·21	140	99·60	130	....		99·15	160			99·16	155

Note.—Gauge heights are those read on the D. P. W. Lake gauge.

Monthly Discharge of Headrace, Old K.L. & M. Co. Near 2nd Bridge, for 1915.
[Drainage area 26,400 square miles.]

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet.
January	180	160	168			10,300
February	180	165	180			10,000
March	175	155	163			10,000
April	205	175	181			10,000
May	198	80	156			9,550
June	280	115	187			11,100
July	235	140	199			12,200
August	217	100	164			10,100
September	200	63	158			9,400
October	200	100	159			9,800
November	172	103	130			7,750
December	161	145	152			9,350
The Year	280	63	166			120,350

Note.—Discharge per square mile and run-off depth in inches omitted. The outlet is one of several from the Lake of the Woods.

C.P.R. CULVERT AT MINK BAY.

HISTORY.

This channel is a tunnel excavated in solid rock under the C.P.R. embankment and connects Mink Bay and Darlington Bay, the latter being an arm of the Winnipeg river. The station was established on July 29th, 1912, by S. S. Scovil, and has since been continuously maintained.

LOCATION OF SECTION.

The section is about 25 feet above the entrance to the tunnel which is about 2,000 feet west of the Old K.L. & M. mill on Mink Bay and forms the outlet for that bay into Darlington bay. The I.P. is a stake driven in the bank at the west side of the channel about 25 feet above the mouth of the tunnel.

RECORDS AVAILABLE.

Meterings have been made at close intervals from July 29, 1912, but no gauge heights are available, so no discharge curve has been constructed.

DRAINAGE AREA.

Not significant as most of the water flowing past this station is leakage through the K.L. & M. Co.'s head gates from Lake of the Woods.

GAUGE.

No gauge has been installed, water levels at the time of metering being obtained by measuring down from a point of rock which is referred to W.P.S. datum.

CHANNEL.

The channel is a rock cut and is constant in section above and below point of metering.

DISCHARGE MEASUREMENTS.

The meterings are taken by Price meter from a plank bridged across the channel.

ACCURACY.

The results obtained are good as the governing conditions are constant. No attempt has been made to obtain the daily discharges from daily gauge heights.

DISCHARGE MEASUREMENTS OF C.P.R. CULVERT AT 1ST TUNNEL WEST OF KEEWATIN, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec.-ft.
Jan. 4	C. C. Galloway	1,718	17	53	3·38	41·00	180
4	"	1,718	17	53	3·38	41·00	181
20	"	1,718	17	54	3·15	41·04	172
20	"	1,718	17	54	3·17	41·04	171
April 14	"	1,718	17	55	2·92	40·99	160
14	"	1,718	17	55	2·92	40·99	161
June 18	"	1,718	18	57	3·10	41·19	176
18	"	1,718	18	57	3·08	41·19	175
Aug. 13	"	1,374	17	64	2·80	41·63	178
13	"	1,374	17	64	2·80	41·63	178
Sept. 15	"	1,374	17	55	3·23	41·07	177
15	"	1,374	17	55	3·23	41·07	177
Oct. 20	"	1,496	17	52	3·01	40·89	156
20	"	1,496	17	52	3·06	40·89	159
Nov. 17	"	1,435	17	51	2·89	40·86	148
17	"	1,435	17	51	3·03	40·86	155
Dec. 17	"	2,019	17	51	2·82	40·84	143
17	"	2,019	17	51	2·97	40·84	151

WAR EAGLE OUTLET.

HISTORY.

The station was established by Mr. S. S. Scovil on July 29, 1912.

LOCATION OF SECTION.

The station is situated at downstream end of the culvert under the C.P.R. embankment on the outlet of War Eagle lake about ¼ mile below the lake and near Darlington bay into which it empties. The I. P. is marked on the rock forming the R. side of the channel at the mouth of the tunnel.

RECORDS AVAILABLE.

A number of meterings have been made during the period 1912-1913 but no gauge records have been kept.

DRAINAGE AREA.

The area tributary is about 50 square miles.

GAUGE.

No gauge has been established but the elevation of the water surface is obtained by measuring down from a fixed point marked on the rock near the section.

CHANNEL.

The channel is straight for 20 feet above the section and 60 feet below. The section is fairly uniform, being an artificial rock-cut.

DISCHARGE MEASUREMENTS.

The meterings are made from a plank bridged from side to side of the channel.

ACCURACY.

As only a few discharge measurements have been made covering a very narrow range in stage, no estimate has been made of daily discharge.

Discharge Measurements of War Eagle Outlet Near Keewatin, Ont., 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 20.	S. C. O'Grady.	1,718	5·5	3·9	0·74	—6·90	2·9
20.	" .	1,718	5·5	3·9	0·85	—6·90	3·3
July 19.	C. C. Galloway. .	1,374	7·5	8·5	1·74	—6·38	14·8
19	" .	1,374	7·5	8·5	1·72	—6·38	14·8

NORTH TUNNEL ISLAND.

HISTORY.

The station at North Tunnel Island was established on June 28, 1912, by Mr. S. S. Scovil.

LOCATION.

The meter section is on the west branch of the Winnipeg river on the north side of Tunnel Island about one mile below the Keewatin River Bridge. The I.P. of the section is chiselled in the rock on the south bank of the river and is painted "I.P. W.P.S. El. 1039.88."

RECORDS AVAILABLE.

Frequent discharge measurements have been made since the establishment of the station and daily discharges have been estimated for this section from the year 1907 to date.

DRAINAGE AREA.

The drainage area lying above this section is 26,400 square miles, but all of the water coming from this basin does not pass this section as part of it goes through the east branch of the Winnipeg, the two, the east and the west branch joining a short distance below the section.

GAUGE.

A vertical staff gauge reading to 10ths is located on a pile bent at the south end of the Keewatin River Bridge and to which all measurements at the station are referred. The zero of the gauge is referred to W.P.S. datum.

A vertical staff gauge read during metering is located on the north shore about 30 feet above the meter section and is bolted to the rock. It is referred to W.P.S. datum.

CHANNEL.

The river at this point is confined to a single channel at all stages, the bed of the stream is solid rock or boulders and of a very permanent nature, the banks are high and rocky and the river is confined to its channel at all stages. The approach to the section is straight for 100 feet and maintains the same direction for approximately 100 feet below, the cross section being approximately uniform over that distance.

DISCHARGE MEASUREMENTS.

Numerous discharge measurements have been taken at this station and cover a range in stage of 6·3 feet. Owing to the fact that part of the water flowing past this section enters the river through the Lake of the Woods Milling Company's plants which discharge into Darlington bay, and part of the water is discharged through the Norman Dam on the western outlet of the Lake of the Woods, the conditions governing discharge at this point vary from time to time and considerable difficulty is experienced in arriving at the daily discharge by means of a discharge curve, the ponding effect in Darlington bay having a very noticeable effect.

ACCURACY.

Owing to the presence of the mills and the operation of the Norman Dam the accuracy of the records is considerably affected.

DISCHARGE MEASUREMENTS OF WEST BRANCH WINNIPEG RIVER NEAR NORTH TUNNEL ISLAND, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per Sec.	Feet.	Sec.-ft.	Gauge at Meter Sec.
Jan. 7.	S. C. O'Grady....	1,718	163	4,579	2·02	35·75	9,248	35·65
7.	“ ...	1,718	163	4,579	2·05	35·75	9,406	35·65
9.	“ ...	1,718	163	4,584	2·04	35·78	9,336	35·68
9.	“ ...	1,718	163	4,584	2·01	35·78	9,235	35·68
11.	“ ...	1,718	163	4,557	2·03	35·65	9,248	35·15
11.	“ ...	1,718	163	4,557	2·03	35·65	9,267	35·15
14.	“ ...	1,718	163	4,589	2·05	35·80	9,392	35·71
14.	“ ...	1,718	163	4,589	2·03	35·80	9,342	35·71
16.	“ ...	1,718	163	4,590	2·05	35·82	9,426	35·72
16.	“ ...	1,718	163	4,590	2·02	35·82	9,261	35·72
19.	“ ...	1,718	163	4,581	2·03	35·72	9,319	35·66
19.	“ ...	1,718	163	4,581	2·03	35·72	9,319	35·66
22.	“ ...	1,718	163	4,601	2·07	35·83	9,512	35·79
25.	“ ...	1,718	163	4,560	1·94	35·62	8,856	35·53
25.	“ ...	1,718	163	4,560	1·99	35·62	9,069	35·53
26.	“ ...	1,718	163	4,595	2·04	35·84	9,373	35·75
30.	“ ...	1,718	163	4,605	2·08	35·86	9,576	35·81
31.	C. C. Galloway...	1,718	163	4,573	1·82	35·67	8,319	35·64
31.	“ ...	1,718	163	4,573	1·83	35·67	8,388	35·61
31.	“ ...	1,718	163	4,563	1·81	35.61	8,281	35·545
31.	“ ...	1,718	163	4,563	1·83	35·61	8,367	35·545
31.	“ ...	1,718	163	4,557	1·77	35·56	8,055	35·51
31.	“ ...	1,718	163	4,557	1·83	35·56	8,340	35·51
Feb. 1.	S. C. O'Grady....	1,718	163	4,555	1·94	35·56	8,838	35·505
1.	“ ...	1,718	163	4,563	2·01	35·61	9,181	35·55
1.	“ ...	1,718	163	4,571	1·98	35·63	9,069	35·595
1.	“ ...	1,718	163	4,573	2·00	35·68	9,159	35·61
1.	“ ...	1,718	163	4,574	2·00	35·70	9,156	35·625
1.	“ ...	1,718	163	4,574	2·04	35·72	9,348	35·625
2.	C. C. Galloway...	1,718	163	4,587	2·04	35·75	9,342	35·695
2.	“ ...	1,718	163	4,587	2·01	35·75	9,211	35·695
6.	S. C. O'Grady....	1,718	163	4,601	2·00	35·83	9,197	35·79
6.	“ ...	1,718	163	4,601	2·04	35·83	9,384	35·79
11.	“ ...	1,718	163	4,601	2·04	35·88	9,393	35·79
11.	“ ...	1,718	163	4,601	2·08	35·88	9,554	35·79
16.	“ ...	1,718	163	4,598	1·87	35·84	8,587	35·77
16.	“ ...	1,718	163	4,598	1·92	35·84	8,835	35·77
24.	“ ...	1,718	163	4,596	2·10	35·85	9,673	35·76
24.	“ ...	1,718	163	4,596	2·17	35·85	9,968	35·76
26.	C. C. Galloway...	1,718	163	4,598	2·12	35·84	9,777	35·77
26.	“ ...	1,718	163	4,598	2·13	35·84	9,809	35·77
Mar. 4.	S. C. O'Grady....	1,718	163	4,582	2·03	35·80	9,319	35·67
4.	“ ...	1,718	163	4,582	2·09	35·80	9,568	35·67
6.	“ ...	1,718	163	4,585	2·06	35·80	9,443	35·69
6.	“ ...	1,718	163	4,585	1·99	35·80	9,142	35·69
12.	“ ...	1,718	163	4,544	1·89	35·54	8,598	35·43
12.	“ ...	1,718	163	4,544	1·95	35·54	8,847	35·43
16.	“ ...	1,718	163	4,515	1·90	35·35	8,600	35·25
16.	“ ...	1,718	163	4,515	1·93	35·35	8,727	35·25
19.	“ ...	1,718	163	4,519	1·89	35·35	8,522	35·27
19.	“ ...	1,718	163	4,519	1·89	35·35	8,524	35·27
23.	“ ...	1,718	163	4,506	1·92	35·28	8,766	35·19
23.	“ ...	1,718	163	4,506	1·88	35·28	8,577	35·19
April 1.	“ ...	1,718	163	4,527	1·95	35·38	8,819	35·32
1.	“ ...	1,718	163	4,527	1·89	35·38	8,572	35·32
6.	“ ...	1,718	163	4,495	1·84	35·23	8,263	35·12
9.	“ ...	1,718	171	4,786	3·02	37·08	14,470	36·845
9.	“ ...	1,718	171	4,786	2·99	37·08	14,325	36·845
13.	“ .	1,718	171	4,905	3·10	37·78	15,174	37·565
13	“ ...	1,718	171	4,905	3·03	37·78	14,838	37·565
15.	“ ..	1,718	171	4,940	3·02	38·00	14,929	37·79
15.	“ .	1,718	171	4,940	3·09	38·00	15,256	37·79
17.	“ .	1,718	171	4,961	2·99	38·11	14,826	37·92
17.	“ ...	1,718	171	4,961	3·08	38·11	15,284	37·92

Discharge Measurements of West Branch Winnipeg River Near North Tunnel Island, 1915—Continued.

Date.	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per Sec.	Feet.	Sec.-ft.	Gauge at Meter Sec.
April 18.	S. C. O'Grady...	1,718	171	4,910	2·92	37·87	14,348	37·73
18.	" ...	1,718	171	4,910	2·90	37·87	14,245	37·73
20.	C. C. Galloway...	1,718	171	4,968	3·03	38·16	15,063	37·96
20.	" ...	1,718	171	4,968	3·08	38·16	15,318	37·96
22.	" ...	1,718	171	4,983	3·08	38·14	15,339	38·05
22.	" ..	1,718	171	4,983	3·12	38·14	15,545	38·05
24.	" ..	1,718	171	5,018	3·14	38·48	15,791	38·265
24.	" ...	1,718	171	5,018	3·08	38·48	15,440	38·265
27.	" ...	1,718	171	5,017	3·10	38·47	15,554	38·26
27.	" .	1,718	171	5,017	3·07	38·47	15,374	38·26
30.	" ...	1,718	171	5,022	3·04	38·47	15,254	38·29
30.	" ...	1,718	171	5,022	2·99	38·47	15,008	38·29
May 4.	" ...	1,718	171	5,007	3·07	38·40	15,390	38·20
4.	" ...	1,718	171	5,007	3·04	38·40	15,232	38·20
8.	" ...	1,718	174	5,033	3·02	38·47	15,224	38·30
8.	" ...	1,718	174	5,033	2·96	38·47	14,910	38·30
11.	" ...	1,718	174	5,021	3·16	38·44	15,822	38·23
11.	" ...	1,718	174	5,021	3·16	38·44	15,856	38·23
14	" ...	1,718	174	5,041	3·13	38·60	15,771	38·41
14.	" ...	1,718	174	5,041	3·15	38·60	15,890	38·41
21.	A. Pirie......... M. S. Madden...	1,469	183	5,364	4·31	40·59	23,138	40·175
21.	C. C. Galloway...	1,469	183	5,366	4·27	40·60	22,916	40·18
21.	S. C. O'Grady.... N. Galloway.....	1,469	183	5,364	4·15	40·57	22,132	40·17
28.	C. C. Galloway...	1,718	181	5,253	3·59	39·83	18,856	39·54
28.	" ...	1,718	181	5,253	3·56	39·83	18,710	39·54
June 1.	" ...	1,718	181	5,233	3·52	39·73	18,437	39·43
8.	" ...	1,718	181	5,317	3·43	39·62	17,910	39·34
8.	" ...	1,718	181	5,317	3·43	39·62	17,904	39·34
12	" ...	1,718	181	5,328	3·60	39·75	18,870	39·46
12	" ...	1,718	181	5,328	3·50	39·75	18,350	39·46
15.	" ...	1,718	181	5,229	3·58	39·71	18,833	39·41
18.	" ...	1,718	181	5,246	3·55	39·82	18,651	39·51
18	" ...	1,718	181	5,246	3·57	39·82	18,715	39·51
22	" ...	1,718	181	5,255	3·70	39·88	19,430	39·56
22.	" ...	1,718	181	5,255	3·73	39·88	19,601	39·56
24.	" .	1,718	181	5,279	3·68	40·00	19,475	39·70
24	"	1,718	181	5,279	3·72	40·00	19,659	39·70
July 8	" .	1,374	186	5,503	4·35	41·39	23,939	40·93
8.	"	1,374	186	5,503	4·40	41·39	24,214	40·93
10.	"	1,374	186	5,530	4·42	41·51	24,441	41·08
10.	" .	1,374	186	5,530	4·46	41·51	24,663	41·08
13.	"	1,374	186	5,521	4·24	41·44	23,411	41·03
13	"	1,374	186	5,521	4·32	41·44	23,852	41·03
15	"	1,374	186	5,512	4·41	41·39	24,308	40·98
15	"	1,374	186	5,512	4·34	41·39	23,922	40·98
21	"	1,374	186	5,500	4·35	41·33	23,923	40·91
21	"	1,374	186	5,500	4·29	41·33	23,593	40·91
27.	"	1,374	187	5,539	4·50	41·59	24,924	41·12
27.	"	1,374	187	5,539	4·51	41·59	24,979	41·12
30	"	1,374	188	5,566	4·53	41·85	25,212	41·55
30.	"	1,374	188	5,566	4·53	41·69	25,212	41·26
Aug. 4	"	1,374	188	5,539	4·36	41·51	24,149	41·11
4	"	1,374	188	5,539	4·43	41·51	24,537	41·11
7	"	1,374	188	5,530	4·35	41·47	24,055	41·06
7	"	1,374	188	5,530	4·44	41·47	24,386	41·06
10.	"	1,374	187	5,473	4·16	41·16	22,769	40·76
10.	"	1,374	187	5,473	4·12	41·16	22,550	40·76
12	"	1,374	185	5,447	4·04	40·99	22,006	40·63
12	"	1,374	185	5,447	4·12	40·99	22,442	40·63
14	"	1,374	185	5,445	4·21	41·00	22,925	40·62
14	"	1,374	185	5,445	4·15	41·00	22,598	40·62
17	"	1,374	184	5,418	4·07	40·84	22,052	40·47

DISCHARGE MEASUREMENTS OF WEST BRANCH WINNIPEG RIVER NEAR NORTH TUNNEL ISLAND, 1915—Continued.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Gauge at Meter Sec.
Aug. 17.	C. C. Galloway...	1,374	184	5,418	4·12	40·84	22,323	40·47
26.	“ ...	1,374	169	4,885	2·35	37·63	11,480	37·48
26.	“ ...	1,374	169	4,885	2·32	37·63	11,334	37·48
31.	“ ...	1,374	167	4,776	2·37	36·93	11,318	36·83
31.	“ ...	1,374	167	4,776	2·39	36·93	11,414	36·83
Sept. 2.	“ ...	1,374	167	4,793	2·57	37·05	12,319	36·94
2.	“ ...	1,374	167	4,793	2·57	37·05	12,319	36·94
4.	“ ...	1,374	167	4,787	2·57	37·05	12,303	36·90
4.	“ ...	1,374	167	4,787	2·60	37·05	12,446	36·90
7.	“ ...	1,374	167	4,769	2·53	36·94	12,066	36·79
9.	“ ...	1,374	167	4,776	2·51	36·95	11,987	36·83
9.	“ ...	1,374	167	4,776	2·51	36·95	11,987	36·83
11.	“ ...	1,374	167	4,774	2·51	36·92	11,983	36·82
11.	“ ...	1,374	167	4,774	2·48	36·92	11,840	36·82
16.	“ ...	1,374	167	4,784	2·51	37·00	12,007	36·88
16.	“ ...	1,374	167	4,784	2·47	37·00	11,816	36·88
18.	“ ...	1,374	167	4,773	2·37	36·90	11,311	36·81
18.	“ ...	1,374	167	4,773	2·41	36·90	11,502	36·81
21.	“ ...	1,374	167	4,756	2·45	36·83	11,653	36·71
21.	“ ...	1,374	167	4,756	2·42	36·83	11,511	36·71
23.	“ ...	1,374	167	4,768	2·47	36·91	11,776	36·78
23.	“ ...	1,374	167	4,768	2·44	36·91	11,633	36·78
28.	“ ...	1,374	167	4,755	2·47	36·83	11,745	36·71
28.	“ ...	1,374	167	4,755	2·41	36·83	11,459	36·71
Oct. 2.	“ ...	1,374	164	4,649	1·98	36·15	9,206	36·08
2.	“ ...	1,374	164	4,649	2·00	36·15	9,299	36·08
5.	“ ...	1,374	163	4,593	2·00	35·82	9,186	35·74
5.	“ ...	1,374	163	4,593	2·01	35·82	9,232	35·74
9.	“ ...	1,496	163	4,590	1·99	35·82	9,150	35·72
9.	“ ...	1,496	163	4,590	2·02	35·82	9,258	35·72
12.	“ ...	1,496	163	4,574	2·02	35·73	9,222	35·62
12.	“ ...	1,496	163	4,574	1·97	35·73	9,007	35·62
14.	“ ...	1,496	163	4,574	2·02	35·73	9,267	35·62
14.	“ ...	1,496	163	4,574	1·99	35·73	9,098	35·62
16.	“ ...	1,496	163	4,576	1·92	35·74	8,824	35·63
16.	“ ...	1,496	163	4,576	1·97	35·74	9,025	35·63
19.	“ ...	1,496	163	4,555	2·00	35·58	9,124	35·50
19.	“ ...	1,496	163	4,555	2·03	35·58	9,233	35·50
21.	“ ...	1,496	163	4,561	1·94	35·64	8,849	35·54
21.	“ ...	1,496	163	4,561	1·97	35·64	8,985	35·54
26.	“ ...	1,496	163	4,569	1·83	35·67	8,364	35·59
26.	“ ...	1,496	163	4,569	1·87	35·67	8,530	35·59
28.	“ ...	1,435	163	4,572	1·92	35·70	8,779	35·61
28.	“ ...	1,435	163	4,572	1·90	35·70	8,687	35·61
30.	“ ...	1,435	163	4,571	1·94	35·68	8,867	35·60
30.	“ ...	1,435	163	4,571	1·89	35·68	8,639	35·60
Nov. 2.	“ ...	1,435	163	4,563	1·93	35·64	8,806	35·55
2.	“ ...	1,435	163	4,563	1·87	35·64	8,532	35·55
4.	“ ...	1,435	163	4,563	1·91	35·63	8,715	35·55
4.	“ ...	1,435	163	4,563	1·87	35·63	8,532	35·55
6.	“ ...	1,435	163	4,568	1·91	35·68	8,724	35·58
6.	“ ...	1,435	163	4,568	1·95	35·68	8,907	35·58
9.	“ ...	1,435	163	4,577	1·93	35·72	8,834	35·64
9.	“ ...	1,435	163	4,577	1·95	35·72	8,925	35·64
12.	“ ...	1,435	163	4,579	1·96	35·75	8,974	35·65
12.	“ ...	1,435	163	4,579	2·03	35·75	9,295	35·65
16.	“ ...	1,435	163	4,574	1·90	35·72	8,690	35·62
16.	“ ...	1,435	163	4,574	1·94	35·72	8,873	35·62
18.	“ ...	1,435	163	4,576	1·90	35·73	8,694	35·63
18	“ ...	1,435	163	4,576	1·92	35·73	8,785	35·63
20.	“ ...	1,435	163	4,572	1·90	35·70	8,687	35·61
20.	“	1,435	163	4,572	1·76	35·70	8,504	35·61
23.	“	1,435	163	4,566	1·81	35·70	8,264	35·57
23	“	1,435	163	4,566	1·83	35·70	8,356	35·57

Discharge Measurements of West Branch Winnipeg River Near North Tunnel Island, 1915.—Continued.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	Gauge at Meter Sec.
Nov. 25.	C. C. Galloway...	1,435	163	4,567	1·92	35·68	8,770	35·58
25.	" ...	1,435	163	4,567	1·87	35·68	8,541	35·58
27.	" ...	1,435	163	4,567	1·92	35·66	8,724	35·58
27.	" ...	1,435	163	4,567	1·88	35·66	8,587	35·58
30.	" ...	1,435	163	4,561	1·90	35·65	8,266	35·54
30.	" ...	1,435	163	4,561	1·88	35·65	8,575	35·54
Dec. 2.	" ...	1,435	162	4,566	1·90	35·65	8,675	35·57
2.	" ...	1,435	162	4,566	1·91	35·65	8,721	35·57
4	" ...	1,435	162	4,561	1·90	35·62	8,666	35·535
4.	" ...	1,435	162	4,561	1·88	35·62	8,575	35·535
9.	" ...	2,019	162	4,536	1·90	35·49	8,618	35·375
9.	" ...	2,019	162	4,536	1·87	35·49	8,482	35·375
11.	" ...	2,019	162	4,558	1·96	35·60	8,934	35·52
11.	" ...	2,019	162	4,558	1·93	35·60	8,797	35·52
14.	" ...	2,019	162	4,564	1·96	35·65	8,946	35·56
14.	" ...	2,019	162	4,564	1·95	35·65	8,900	35·56
16.	" ...	2,019	162	4,569	1·95	35·68	8,910	35·59
16.	" ...	2,019	162	4,569	1·94	35·68	8,864	35·59
20.	" ...	2,019	162	4,560	1·94	35·60	8,846	35·53
20.	" ...	2,019	162	4,560	1·90	35·60	8,663	35·53
23.	" ...	2,019	162	4,574	1·97	35·72	9,011	35·62
23.	" ...	2,019	162	4,574	1·91	35·72	8,736	35·62

DAILY GAUGE HEIGHT AND DISCHARGE OF WEST BRANCH WINNIPEG RIVER NEAR NORTH TUNNEL ISLAND, FOR 1915.

[Drainage area 26,400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	35·48	8,100	35·61	8.750	35·56	9,000	35·41	8,750	38·47	15,100	39·71	18,450
2	35·48	8,200	35·78	9,275	35·74	9,450	35·34	8,500	38·42	14,480	39·72	18,400
3	35·52	8,050	35·82	9,300	35·75	9,450	35·35	8,520	38·20	15,110	39·69	18,295
4	35·45	8,700	35·82	9,300	35·76	9,450	35·24	8,050	38·38	15,170	39·67	18.115
5	35·61	9,075	35·84	9,300	35·77	9,500	35·17	8,200	38·41	15,190	39.65	17,860
6	35·66	9,225	35·84	9,275	35·77	9,250	35·20	8,280	38·04	15,210	39·55	17,400
7	35·71	9,325	35·65	8,175	35·61	8,500	35·29	10,000	38·53	15,215	39·55	18,080
8	35·75	9,300	35·60	8,900	35·51	8,850	35·96	13,000	38·50	15,200	39·62	17,910
9	35·76	9,275	35·81	9,300	35·72	9,250	36·91	14,000	38·36	14,490	39.69	18,240
10	35·62	8,400	35·82	9,375	35·76	9,250	37·32	14,500	38·28	15,315	39·75	18,500
11	35·53	8,800	35·85	9,475	35·60	8,750	37·38	13,800	38·43	15,710	39·75	18,615
12	35·70	9,300	35·85	9,475	35·53	8,750	37·50	14,780	38·53	15,790	39·73	18,605
13	35·75	9,325	35·85	9,475	35·50	8,700	37·74	14,960	38·58	15,835	39·59	17,960
14	35·79	9,375	35·65	8,700	35·34	8,200	37·86	15,020	38·62	15,850	39·61	18,695
15	35·79	9,375	35·62	8,500	35·30	8,500	37·95	15,050	38·61	15,840	39·69	18,840
16	35·80	9,350	35·83	8.725	35·35	8,650	38·03	15,070	38·41	14,980	39·72	18,835
17	35·62	8,400	35·84	9,000	35·33	8,650	38·09	15,040	38·40	16,100	39·74	18,815
18	35·56	8,800	35·85	9,300	35·33	8,550	37·96	14,280	39·03	19,200	39·77	18,890
19	35·76	9,325	35·88	9,550	35·34	8,500	37·94	15,000	39·70	21,910	39·77	19,280
20	35·81	9,450	35·84	9,600	35·35	8,500	38·15	15,180	40·28	23,815	39·70	18,810
21	35·84	9,500	35·67	8,600	35·22	8,050	38·18	15,350	40·54	22,750	39·76	19,410
22	35·83	9,525	35·60	9,100	35·18	8,250	38·24	15,440	40·35	21,000	39·90	19,540
23	35·83	9,500	35·80	9,725	35·26	8,700	38·33	15,580	39·94	19,600	39·99	19,550
24	35·66	8,600	35·83	9,800	35·31	8.700	38·44	15,620	39·80	19,780	40·01	19,560
25	35·62	9,000	35·85	9,800	35·35	8,700	38·28	14,600	39·82	19,390	40·05	19,255
26	35·82	9,375	35·86	9,800	35·38	8,700	38·24	15,220	39·82	19,080	40·02	19,200
27	35·84	9,450	35·86	9,775	35·38	8,700	38·42	15,300	39·84	18,900	39·99	18,960
28	35·86	9,525	35·64	8,750	35·24	8,150	38·46	15,350	39·82	18,740	40·09	19,400
29	35·87	9,550	....	....	35·29	8,650	38·48	15,400	39·81	18,500	40·35	20,420
30	35·86	9,575	....	....	35·50	9,300	38·49	15,300	39·67	17,590	40·67	21,300
31	35·67	8,300	....	....	35·53	8.900	....	....	39·65	18,410	....	....

	July.		August.		September.		October.		November.		December.	
1	40·92	22,500	41·53	23,715	37·00	12,010	36·30	10,205	35·65	8,640	35·67	8,680
2	40·98	23,100	41·47	24,290	37·09	12,320	36·16	9,260	35·63	8,680	35·66	8,690
3	41·09	23,595	41·56	24,340	37·10	12,350	35·83	8,300	35·64	8,700	35·67	8,675
4	41·09	23,515	41·53	24,350	37·05	12,360	35·62	9,115	35·66	8,590	35·65	8,615
5	41·17	23,790	41·51	24,260	36·94	11,490	35·84	9,205	35·66	8,815	35·37	8,050
6	41·20	23,905	41·49	24,235	36·78	11,985	35·91	9,200	35·65	8,770	35·28	8,445
7	41·29	24,000	41·47	24,215	36·93	12,080	35·87	9,195	35·63	8,600	35·51	8,530
8	41·40	24,080	41·38	23,550	36·97	12,045	35·85	9,190	35·64	8,685	35·51	8,525
9	41·45	24,440	41·30	24,100	36·96	11,990	35·84	9,205	35·69	8,760	35·49	8,555
10	41·48	24,535	41·14	22,640	36·97	11,910	35·62	8,305	35·72	9,100	35·55	8,700
11	41·40	23,905	41·04	22,310	36·94	11,900	35·55	9,000	35·71	9,120	35·60	8,845
12	41·36	24,145	40·99	22,190	36·78	10,890	35·69	9,120	35·70	9,160	35·57	8,890
13	41·44	24,160	40·97	22,485	36·70	11,500	35·73	9,150	35·67	8,980	35·60	8,905
14	41·41	24,140	40·98	24,755	36·84	11,695	35·74	9,160	35·65	8,730	35·67	8,910
15	41·40	24,100	40·89	22,105	36·92	11,860	35·74	9,130	35·69	8,790	35·69	8,905
16	41·39	24,190	40·79	22,300	36.95	11,915	35·73	8,980	35·71	8,760	35·73	8,890
17	41·37	24,105	40·83	22,180	36·95	11,805	35·52	8,215	35·72	8,790	35·77	8,880
18	41·28	23,495	40·79	21,300	36·93	11,400	35·51	9,010	35·73	8,770	35·77	8,830
19	41·26	23,810	40·74	20,000	36·75	10,510	35·61	9,140	35·73	8,690	35·70	8,725
20	41·38	23,750	40·55	17,000	36·66	11,405	35·61	9,105	35·72	8,590	35·66	8,760
21	41·33	23,780	39·91	14,000	36·77	11,600	35·62	8,950	35·69	8,500	35·73	8,820
22	41·31	23,675	39·07	13,490	36·86	11,795	35·64	8,840	35·69	8,570	35·74	8,825
23	41·29	23,610	38·66	13,590	36·88	11,710	35·66	8,715	35·69	8,480	35·74	8,855
24	41·27	23,995	38·35	13,400	36·85	11,655	35·65	8,745	35·67	8,515	35·69	8,850
25	41·37	23,815	38·02	13,200	36·89	11,605	35·69	8,800	35·67	8,630	35·42	7,910
26	41·45	24,680	37·58	11,550	36·71	10,390	35·69	8,450	35·67	8,715	35·15	8,375
27	41·57	24,960	37·41	11,490	36·63	11,510	35·69	8,550	35·65	8,660	35·45	8,695
28	41·65	25,245	37·24	11,405	36·84	11,590	35·70	8,650	35·62	8,520	35·59	8,800
29	41·69	25,300	37·07	11,300	36·88	11,500	35·71	8,740	35·63	8,590	35·64	8,830
30	41·68	25,220	37·08	11,345	36·73	11,000	35·71	8,760	35·65	8,605	35·72	8,860
31	41·65	24,700	36·98	11,380	....	....	35·67	8,795			35·74	8,890

NOTE.—Gauge heights are those read at the Keewatin River Bridge gauge

MONTHLY DISCHARGE OF WEST BRANCH WINNIPEG RIVER NEAR NORTH TUNNEL ISLAND FOR 1915.

[Drainage area 26,400 square miles.]

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	9,575	8,050	9,066	....	....	557,400
February	9,800	8,175	9,218	....	....	511,900
March	9,500	8,150	8,790	....	....	540,500
April	15,620	8,050	13,438	....	....	799,700
May	23,815	14,480	17,395	....	....	1,069,500
June	21,300	17,400	18,840	....	....	1,267,400
July	25,300	22,500	24,072	....	....	1,480,100
August	24,755	11,300	19,112	....	....	1,175,100
September	12,360	10,390	11,659	....	....	693,700
October	10,205	8,215	8,941	....	....	549,800
November	9,160	8,480	8,717	....	....	518,700
December	8,910	7,910	8,700	....	....	534,900
The Year	25,300	7,910	13,162	....	....	9,698,700

NOTE—Discharge per square mile and run-off depth in inches omitted. The outlet is one of several from the Lake of the Woods.

COMBINED DISCHARGE OF WINNIPEG RIVER BELOW LAKE OF THE WOODS OUTLETS, FOR 1915.

[Drainage area 26,400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	....	8,943	....	9,918	....	9,905	....	9,434	....	15,917	....	19,384
2	....	9,076	....	10,462	....	10,496	....	9,148	....	15,125	....	19,322
3	....	8,883	....	10,331	....	10,476	....	9,436	....	16,131	....	19,204
4	....	9,545	....	10,429	....	10,436	....	8,683	....	16,259	....	19,018
5	....	9,912	....	10,463	....	10,615	....	9,079	....	16,282	....	18,782
6	....	10,265	....	10,265	....	10,256	....	9,155	....	16,313	....	18,086
7	....	10,408	....	8,903	....	9,178	....	10,880	....	16,122	....	18,931
8	....	10,358	....	10,058	....	9,963	....	13,877	....	16,122	....	18,870
9	....	10,302	....	10,374	....	10,365	....	15,016	....	15,140	....	19,167
10	....	9,181	....	10,502	....	10,348	....	15,396	....	15,974	....	19,437
11	....	9,840	....	10,479	....	9,681	....	14,433	....	16,385	....	19,522
12	....	10,322	....	10,613	....	9,675	....	15,627	....	16,574	....	19,508
13	....	10,488	....	10,427	....	9,586	....	15,852	....	16,647	....	18,638
14	....	10,444	....	9,398	....	8,870	....	16,056	....	16,742	....	19,385
15	....	10,454	....	9,607	....	9,164	....	16,099	....	16,739	....	19,535
16	....	10,386	....	9,724	....	9,309	....	16,141	....	15,640	....	19,538
17	....	9,201	....	10,099	....	9,309	....	15,940	....	16,889	....	19,527
18	....	9,818	....	10,390	....	9,214	....	14,922	....	20,115	....	19,814
19	....	10,486	....	10,620	....	9,179	....	16,085	....	22,978	....	20,143
20	....	10,631	....	10,573	....	9,187	....	16,317	....	24,792	....	19,483
21	....	10,716	....	9,289	....	8,724	....	16,470	....	23,914	....	20,128
22	....	10,738	....	10,119	....	8,924	....	16,567	....	21,904	....	20,280
23	....	10,621	....	10,816	....	9,371	....	16,703	....	20,294	....	20,409
24	....	9,432	....	10,752	....	9,390	....	16,537	....	20,904	....	20,462
25	....	10,215	....	10,891	....	9,667	....	15,260	....	20,362	....	19,971
26	....	10,528	....	10,910	....	9,667	....	16,338	....	20,022	....	19,908
27	....	10,709	....	10,738	....	9,495	....	16,416	....	19,822	....	19,639
28	....	10,777	....	9,433	....	8,829	....	16,478	....	19,678	....	20,232
29	....	10,770	....	....	....	9,527	....	16,502	....	19,382	....	21,347
30	....	10.767	....	....	....	9,999	....	16,452	....	18,279	....	22,246
31	....	9,038	....	....	....	9,781	....	....	....	19,259	....	....

	July.		August.		September.		October.		November.		December	
1	....	23,220	....	24,457	....	12,654	....	11,356	....	10,095	....	10,215
2	....	24,078	....	25,298	....	12,971	....	10,229	....	10,154	....	10,232
3	....	24,511	....	25,192	....	12,992	....	8,961	....	10,162	....	10,229
4	....	24,243	....	25,126	....	13,028	....	10,246	....	10,093	....	10,115
5	....	24,679	....	25,031	....	12,111	....	10,582	....	10,283	....	8,878
6	....	24,886	....	25,006	....	12,608	....	10,599	....	10,274	....	9,682
7	....	24,934	....	25,074	....	12,716	....	10,657	....	9,404	....	9,798
8	....	25,076	....	24,542	....	12,724	....	10,629	....	9,827	....	9,286
9	....	25,442	....	24,918	....	12,700	....	10,632	....	9,822	....	9,629
10	....	25,464	....	23,399	....	12,641	....	9,051	....	10,085	....	10,237
11	....	24,635	....	23,070	....	12,619	....	10.207	....	10,541	....	10,390
12	....	24,963	....	22,940	....	11,529	....	10,541	....	10,089	....	9,934
13	....	24,932	....	23,238	....	12,384	....	10,583	....	10,529	....	10,444
14	....	24,928	....	25,502	....	12,627	....	10,563	....	9,826	....	10,488
15	....	24,887	....	22,822	....	12,788	....	10,543	....	10,347	....	10,471
16	....	24,949	....	23,053	....	12,851	....	10,401	....	10,313	....	10,375
17	....	25,094	....	22,928	....	12,756	....	8,947	....	10.314	....	10,442
18	....	24,217	....	22,058	....	12,347	....	10,142	....	10,285	....	10,408
19	....	24,726	....	20,750	....	11,161	....	9,803	....	10,180	....	9,625
20	....	24,744	....	14,755	....	12,605	....	10,124	....	10,128	....	9,820
21	....	24,556	....	14,726	....	12,572	....	10,372	....	9,649	....	10,326
22	....	24,426	....	14,169	....	12,940	....	10,266	....	10,054	....	10,356
23	....	24,583	....	14,303	....	12,626	....	10,130	....	9,998	....	10,399
24	....	24,749	....	14,105	....	12,796	....	10,138	....	10,024	....	9,701
25	....	24,542	....	13,888	....	12,574	....	10,224	....	10,090	....	8,679
26	....	25,655	....	12,229	....	11,058	....	9,911	....	10,227	....	9,118
27	....	25,743	....	12,162	....	12,673	....	9,970	....	10,155	....	10,042
28	....	26,246	....	12,049	....	12,783	....	10,090	....	9,364	....	10,332
29	....	26,276	....	11,936	....	12,707	....	10,136	....	9,873	....	10,384
30	....	26,004	....	11,994	....	12,018	....	10,179	....	10,118	....	10,431
31	....	25,711	....	12,035	....		....	9,803	....	....	....	10,454

COMBINED MONTHLY DISCHARGE OF WINNIPEG RIVER BELOW LAKE OF THE WOODS OUTLETS, FOR 1915.

[Drainage area 26,400 square miles.]

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches of Drainage Area.	Total in acre-feet.
January	10,777	8,843	10,105	0·383	0·442	621,300
February	10,910	8,903	10,235	0·388	0·404	568,400
March	10,615	8,724	9,632	0·365	0·421	592,300
April	16,703	8,683	14,377	0·545	0·608	855,500
May	24,792	15,125	18,281	0·692	0·798	1,124,100
June	22,246	18,086	19,664	0·745	0·831	1,170,100
July	26,276	23,220	24,939	0·945	1·090	1,533,400
August	25,502	11,936	19,863	0·752	0·867	1,221,400
September	13,028	11,058	12,519	0·474	0·529	744,900
October	11,356	8,947	10,194	0·386	0·445	626,800
November	10,541	9,364	10,077	0·382	0·426	599,600
December	10,486	8,679	10,030	0·380	0·438	616,700
The Year	26,276	8,679	14,160	0·536	7·299	10,274,500

DISCHARGE MEASUREMENTS OF WINNIPEG RIVER AT CONTROL NO. 1, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 18	C. C. McLennan	1,814	219	1,690	0·84	38·46	1,416
19	"	1,814	219	1,814	1·22	39·04	2,205
20	T. J. Moore	1,467	228	1,914	1·27	39·50	2,438

DISCHARGE MEASUREMENTS OF CONTROL NO. 3 AT LAKE OF THE WOODS OUTLETS, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 19	M. S. Madden	4,169	68·5	649	4·68	1,039·42	3,033
19	"	1,469	68·5	649	4·99	1,039·42	3,227
20	A. Pirie	1,939	68·5	670	5·38	1,039·78	3,606

DISCHARGE MEASUREMENTS OF CONTROL NO. 4 AT LAKE OF THE WOODS OUTLETS, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet	Sec.-ft.
May 19	A. Pirie	1,939	146	2,218	4·73	1,039·35	10,553
19	"	1,939	146	2,218	4·80	1,039·28	10,640
20	"	1,939	147	2,308	5·12	1,039·82	11,811

Discharge Measurements of Control No. 5 at Lake of the Woods Outlets, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 19	M. S. Madden	1,469	145	1,955	3·55	1,038·72	6,945
20	"	1,469	150·7	2,121	3·72	1,039·32	7,898

WINNIPEG RIVER AND TRIBUTARIES.

WINNIPEG RIVER.

The Winnipeg river is one of the most important in the province of Manitoba, forming the source of a power supply for the city of Winnipeg. It joins Lake of the Woods to lake Winnipeg flowing in a westerly direction. The drainage area of this river is 53,500 square miles above the mouth. The basin has all the characteristics of the Laurentian formation, being dotted with lakes, ponds and muskegs. A considerable portion of the basin is composed of lake areas the size of which range between a few square miles up to 1,500 square miles, the latter being the surface area of the Lake of the Woods. The country drained is rough and more or less timbered. The upper part of the area has been lumbered to a considerable extent and still affords a field for such industry.

The river itself is of considerable proportions, and its characteristics are lake-like expanses joined by short stretches of swift water or falls. On account of these features splendid opportunity is offered for the development of water power. At the present time advantage has been taken of these possibilities in two cases, and developments are to be found at Point du Bois, where the city of Winnipeg has a municipally owned and operated plant, and on the Pinawa Channel where the plant of the Winnipeg Electric Railway Company is in operation. A number of other sites are capable of economic development and it has been estimated that a total output of approximately 420,000 continuous 24 hour horsepower is available from this river within the province of Manitoba from the regulated river.

In consequence of the importance of this river a number of stations at which records of discharge have been obtained have been established. They are as follows:—

1. The Dalles.
2. Throat Rapids.
3. Minaki.
4. Whitedog Rapids.
5. Slave Falls.
6. Otter Falls.
7. Pinawa Channel.
8. Grand du Bonnet Falls.

At some of these points continuous discharges are not available, the records being confined to a few isolated meterings.

TRIBUTARIES.

The tributaries of the Winnipeg river are, with one exception, of minor importance, having for the most part small drainage areas. This exception is the English river with a drainage area of 21,500 square miles, entering the Winnipeg from the north just within the province of Ontario. The other tributaries of the Winnipeg river are the Whiteshell river which joins the main river in the lake-like expanse known as Jessie lake, the Whitemouth which enters just below the Seven Sisters rapids and the Bird river which flows into Lac du Bonnet.

Of these tributaries, the Whitemouth is the only one for which daily records of discharge are available.

WINNIPEG RIVER AT MINAKI.

HISTORY.

The station was established by C. O. Allen on September 23, 1913. Later it was abandoned for the Whitedog station, difficulty being experienced in operating the station under winter conditions.

LOCATION OF SECTION.

The section is located on the downstream side of the G.T.P. Railway bridge ¾ mile east of the Minaki station and ¼ mile downstream from the Holst Point Hotel. The I.P. is marked by three spikes driven in the guard rail at the west end of the bridge on the downstream side.

RECORDS AVAILABLE.

A daily gauge height record has been kept since September 24, 1913. A number of meterings have been taken but there is not sufficient data to construct a rating curve for the station.

DRAINAGE AREA.

The drainage area above Minaki is 27,000 square miles.

GAUGE.

A vertical staff gauge 6 feet long is fastened to a plank which is spiked to crib work a the east end of the bridge and is 30 feet downstream from the section It is referred to three B.M.'s set to W.P .S. datum.

CHANNEL.

It is straight for 500 feet above the station and 1,000 feet below. The channel is divided by a pier of the bridge which stands in the river about 65 feet from the east shore. The stream is moderately swift but the bed of the stream is not liable to shift. It is confined to the two channels under all stages.

DISCHARGE MEASUREMENTS.

They are made from the bridge deck, the intervals being marked on the guard rail.

ACCURACY.

The channel forms a connecting link or strait between two lake-like expanses; on this account the discharge does not always bear the same relation to gauge heights, the ponding effect below being noticeable. A discharge curve for the station has not been constructed.

WHITEDOG FALLS, NORTH AND SOUTH CHANNELS.

HISTORY.

On May 18, 1914, a metering station was established on the South channel at Whitedog falls by S. C. O'Grady. This station was operated as a boat station until the end of July 1915, when the section was moved upstream approximately 100 feet and a cable station installed.

On May 23, 1914, a cable carrier station was established on the North channel of Whitedog falls, since which date this station has been in operation.

LOCATION OF SECTION.

The section on the South channel is located about 900 feet above the second falls and is reached either by canoe and a short portage at the first falls or by the road and trail on the large island, leading from the H.B. Co. old warehouse at the head of the first falls.

The I.P. is a cross and circle painted on the rock at the base of the tower and marked "I.P." with white paint.

The section on the North channel is located about 20 feet above the head of the first falls. The I.P. is a white arrow painted on the solid rock on the right bank of the channel.

RECORDS AVAILABLE.

The discharge measurements were taken since the establishment of the stations and are referred to the gauge at Minaki which has been operated since September 24, 1913. Daily discharge records are available since that date. The discharges of these stations must be combined to give the total discharge of the Winnipeg river at that point.

DRAINAGE AREA.

The drainage area above the section is 27,500 square miles.

GAUGE.

The gauge on the South channel is a vertical staff gauge bolted to the rock on the left bank, eighty feet below the section; it reads direct.

On the North channel a vertical staff gauge is bolted to the rock on the right bank about forty feet above the section; it is referred to B.M. placed in the solid rock across the stream at the head of the portage. Owing to the impossibility of getting a gauge reader at these sections, all meterings are referred to the gauge at Minaki, which has been read daily since September, 1913.

In August of 1915, a Gurley Water Stage Register with printed record, was set in place at the head of these falls and the records as obtained by this register are available.

Taken by M. C. Hendry.

Winnipeg River—Whitedog Falls—
Automatic Gauge House.

Taken by W. J. Ireland.

Winnipeg River—Whitedog Falls—Cable Station—
South Channel.

CHANNEL.

The South channel is approximately 400 feet wide and is composed of rock and not subject to shifting, the control for the section being the crest of the falls 900 feet below. The banks are high enough to ensure that under flood conditions no overflow will occur. The channel is straight and free from eddies under nearly all conditions.

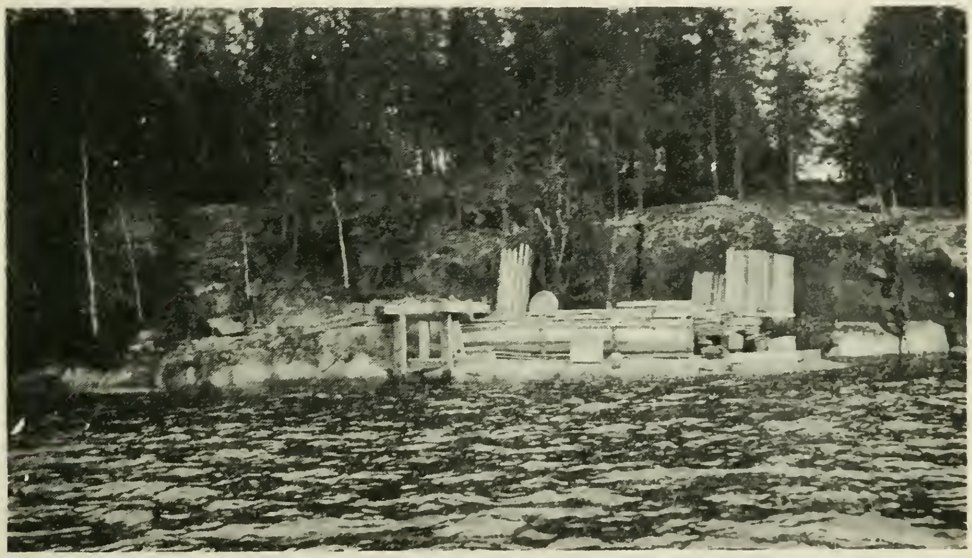
The North channel is much narrower. It is also composed of clay and solid rock and free from likelihood of shifting, the control being 50 feet below. The channel is straight both above and below the section for a sufficient distance to ensure freedom from eddies.

DISCHARGE MEASUREMENTS.

Sufficient meterings have been made to define the discharge curve over a range of 3·0 feet. Forty-six in all have been taken on the North channel, while thirty-five have been taken on the South channel.

ACCURACY.

The discharge curve is well defined between gauge heights 1033 and 1036 W.P.S datum; above and below those heights the curve is only fairly well defined.



Taken by W. J. Ireland.
WINNIPEG RIVER—WHITEDOG FALLS—TIMBER SUPPORT FOR AUTOMATIC GAUGE.

DISCHARGE MEASUREMENTS OF WINNIPEG RIVER NEAR WHITEDOG FALLS, NORTH CHANNEL, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.	
Feb. 22	S. C. O'Grady.	1,718	39	207	1·90	32·94	393	
22.	"	1,718	39	207	1·87	32·94	387	
June 4	"	1,718	46	310	3·29	35·27	1,020	
								Automatic Gauge
Aug. 13	W. J. Ireland	1,939	41	347	3·69	36·13	1,281	1,035·95
19	"	1,939	41	316	3·55	35·96	1,121	1 035·79

Daily Gauge Height and Discharge of Winnipeg River Near North Channel, Whitedog Falls, for 1915.

[Drainage area 27,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1											35·39	995
2											35·37	990
3											35·38	993
4											35·37	990
5											35·37	990
6											35·43	1,006
7											35·33	979
8											35·29	968
9											35·34	982
10											35·36	987
11											35·43	1,006
12											35·38	993
13											35·37	990
14											35·32	976
15											35·37	990
16											35·34	982
17											35·39	995
18									34·66	798	35·41	1,001
19									34·98	885	35·39	995
20									35·34	982	35·39	995
21									35·42	1,003	35·42	1,003
22				390					35·47	1,017	35·41	1,001
23									35·47	1,017	35·44	1,009
24									35·49	1,022	35·45	1,011
25									35·48	1,020	35·49	1,022
26									35·46	1,014	35·52	1,030
27									35·46	1,014	35·42	1,003
28									35·46	1,014	35·46	1,014
29									35·45	1,011	35·49	1,022
30									35·45	1,011	35·52	1,030
31									35·44	1,009		

Day.	July.		August.		September.		October.		November.		December.	
1	35·58	1,047	36·46	1,284	34·85	849	33·53	498	32·97	352	32·98	355
2	35·71	1,082	36·43	1,276	34·69	806	33·49	487	32·96	350	32·99	357
3	35·92	1,138	36·41	1,271	34·46	744	33·45	477	32·96	350	32·99	357
4	35·94	1,144	36·40	1,268	34·25	687	33·38	459	32·96	350	32·99	357
5	36·00	1,160	36·40	1,268	34·20	674	33·34	448	32·95	347	32·96	350
6	36·21	1,217	36·38	1,263	33·76	558	33·25	425	32·96	350	32·94	344
7	36·41	1,271	36·36	1,257	33·78	563	33·19	409	32·99	357	32·93	342
8	36·46	1,284	36·32	1,246	33·81	571	33·16	402	33·03	368	32·92	339
9	36·34	1,252	36·28	1,236	33·66	532	33·12	391	33·06	376	32·91	337
10	36·26	1,230	36·16	1,203	33·66	532	33·09	383	33·08	381	32·92	339
11	36·30	1,211	36·14	1,198	33·66	532	33·05	373	33·10	386	32·93	342
12	36·34	1,252	36·13	1,195	33·66	532	33·04	370	33·09	383	32·93	342
13	36·37	1,260	36·06	1,176	33·66	532	33·04	370	33·07	378	32·94	344
14	36·37	1,260	36·04	1,171	33·63	524	33·03	368	33·06	376	32·94	344
15	36·36	1,257	36·04	1,171	33·63	524	33·02	365	33·05	373	32·95	347
16	36·38	1,263	36·04	1,171	33·63	524	33·02	365	33·04	370	32·98	355
17	36·34	1,252	36·02	1,165	33·63	524	33·01	363	33·03	368	32·99	357
18	36·33	1,249	36·02	1,165	33·63	524	32·99	357	33·03	368	32·98	355
19	36·31	1,244	36·01	1,163	33·61	519	32·98	355	33·02	365	32·99	357
20	36·30	1,241	36·00	1,160	33·61	519	32·96	350	33·03	368	33·00	360
21	36·32	1,246	35·99	1,157	33·61	519	32·91	314	33·02	365	33·00	360
22	36·31	1,244	35·98	1,155	33·61	519	32·93	342	33·01	363	33·00	360
23	36·30	1,241	35·75	1,092	33·58	511	32·92	339	33·01	363	33·00	360
24	36·29	1,238	35·71	1,082	33·58	511	32·95	347	33·00	360	33·00	360
25	36·22	1,219	35·61	1,055	33·58	511	32·95	347	32·99	357	33·00	360
26	36·27	1,233	35·52	1,030	33·57	508	32·96	350	32·99	357	32·97	352
27	36·29	1,238	35·46	1,014	33·57	508	32·96	350	32·98	355	32·94	344
28	36·33	1,249	35·42	1,003	33·57	508	32·97	352	32·98	355	32·92	339
29	36·38	1,263	35·29	968	33·56	506	32·97	352	32·97	352	32·91	337
30	36·43	1,276	35·17	396	33·56	506	32·97	352	32·97	352	32·92	339
31	36·44	1,279	35·04	901			32·98	355			32·94	344

MONTHLY DISCHARGE OF WINNIPEG RIVER AT NORTH CHANNEL, WHITEDOG FALLS, FOR 1915.

[Drainage area 26,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches of Drainage Area.	Total in acre-feet.
January	....	....	[1]330	....	....	20,300
February	....	....	[1]370	....	....	20,500
March	....	....	[1]380	....	....	23,400
April	....	....	[1]450	....	....	26,800
May	....	....	[1]700	....	....	43,000
June	1,030	976	998	....	....	59,400
July	1,284	1,047	1,228	....	....	75,500
August	1,284	901	1,152	....	....	70,800
September	849	506	563	....	....	33,500
October	498	339	382	....	....	23,500
November	386	347	363	....	....	21,600
December	360	337	350	....	....	21,500
The Year	1,284	....	605	....	....	439,800

NOTE.—Marked thus (1) Estimated. Discharge per square mile and Run-off Depth in inches omitted. The channel is one of two of the river, at this point.

DISCHARGE MEASUREMENTS OF WINNIPEG RIVER NEAR WHITEDOG FALLS, SOUTH CHANNEL FALLS, FOR 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per Sec.	Feet.	Sec. ft.	
Feb. 21.	S. C. O'Grady	1,718	327	6,321	1·53	27·77	9,706	
21.	"	1,718	327	6,321	1·54	27·77	9,723	
June 3.	"	1,718	351	7,385	2·52	30·89	18,591	
Aug. 9.	W. J. Ireland	1,939	373	9,109	2·51	32·03	22,934	
								Automatic Gauge New.
18.	"	1,939	373	8,958	2·38	31·63	21,286	1,035·79
23	"	1,939	373	8,751	2·17	31·12	18,942	1,035·33

DAILY GAUGE HEIGHT AND DISCHARGE OF WINNIPEG RIVER AT SOUTH CHANNEL, WHITEDOG FALLS, FOR 1915.

[Drainage area 27,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	...	...	...	...	...	...	...	...	...	...	35·39	18,981
2	...	...	...	...	...	...	...	...	...	...	35·37	18,893
3	...	...	...	...	...	...	...	...	...	...	35·38	18,937
4	...	...	...	...	...	...	...	...	...	...	35·37	18,893
5	...	...	...	...	...	...	...	...	...	...	35·37	18,893
6	...	...	...	...	...	...	...	...	...	...	35·43	19,157
7	...	...	...	...	...	...	...	...	...	...	35·33	18,717
8	...	...	...	...	...	...	...	...	...	...	35·29	18,541
9	...	...	...	...	...	...	...	...	...	...	35·34	18,761
10	...	...	...	...	...	...	...	...	...	...	35·36	18,849
11	...	...	...	...	...	...	...	...	...	...	35·43	19,157
12	...	...	...	...	...	...	...	...	...	...	35·38	18,937
13	...	...	...	...	...	...	...	...	...	...	35·37	18,893
14	...	...	...	...	...	...	...	...	...	...	35·32	18,673
15	...	...	...	...	...	...	...	...	...	...	35·37	18,893
16	...	...	...	...	...	...	...	...	...	...	35·34	18,761
17	...	...	...	...	...	...	...	...	...	...	35·39	18,981
18	...	...	...	...	...	...	...	...	34·66	15,769	35·41	19,069
19	...	...	...	...	...	...	...	...	34·98	17,177	35·39	18,981
20	...	...	...	...	...	...	...	...	35·34	18,761	35·39	18,981
21	...	...	...	9,715	...	...	...	...	35·42	19,113	35·42	19,113
22	...	...	...	...	...	...	...	...	35·47	19,333	35·41	19,069
23	...	...	...	...	...	...	...	...	35·47	19,333	35·44	19,201
24	...	...	...	...	...	...	...	...	35·49	19,421	35·45	19,245
25	...	...	...	...	...	...	...	...	35·48	19,377	35·49	19,421
26	...	...	...	...	...	...	...	...	35·46	19,289	35·52	19,553
27	...	...	...	...	...	...	...	...	35·46	19,289	35·42	19,113
28	...	...	...	...	...	...	...	...	35·46	19,289	35·46	19,289
29	...	...	...	...	...	...	...	...	35·45	19,245	35·49	19,421
30	...	...	...	...	...	...	...	...	35·45	19,245	35·52	19,553
31	...	...	...	...	...	...	...	...	35·44	19,201	...	...

	July.		August.		September.		October..		November.		December.	
1	35·58	19,817	36·46	23,689	34·85	16,605	33·53	11,355	32·97	9,560	32·98	9,590
2	35·71	20,389	36·43	23,557	34·69	15,901	33·49	11,218	32·96	9,530	32·99	9,620
3	35·92	21,313	36·41	23,469	34·46	14,889	33·45	11,087	32·96	9,530	32·99	9,620
4	35·94	21,401	36·40	23,425	34·25	14,025	33·38	10,860	32·96	9,530	32·99	9,620
5	36·00	21,665	36·40	23,425	34·20	13,825	33·34	10,730	32·95	9,500	32·96	9,530
6	36·21	22,589	36·38	23,337	33·76	12,160	33·25	10,437	32·96	9,530	32·94	9,470
7	36·41	23,469	36·36	23,249	33·78	12,230	33·19	10,243	32·99	9,620	32·93	9,440
8	36·46	23,689	36·32	23,073	33·81	12,338	33·16	10,145	33·03	9,740	32·92	9,410
9	36·34	23,161	36·28	22,897	33·66	11,810	33·12	10,015	33·06	9,830	32·91	9,380
10	36·26	22,809	36·16	22,369	33·66	11,810	33·09	9,920	33·08	9,890	32·92	9,410
11	36·30	22,985	36·14	22,281	33·66	11,810	33·05	9,800	33·10	9,950	32·93	9,440
12	36·34	23,161	36·13	22,237	33·66	11,810	33·04	9,770	33·09	9,920	32·93	9,440
13	36·37	23,293	36·06	21,929	33·66	11,810	33·04	9,770	33·07	9,860	32·94	9,470
14	36·37	23,293	36·04	21,841	33·63	11,705	33·03	9,740	33·06	9,830	32·94	9,470
15	36·36	23,249	36·04	21,841	33·63	11,705	33·02	9,710	33·05	9,800	32·95	9,500
16	36·38	23,337	36·04	21,841	33·63	11,705	33·02	9,710	33·04	9,770	32·98	9,590
17	36·34	23,161	36·02	21,753	33·63	11,705	33·01	9,680	33·03	9,740	32·99	9,620
18	36·33	23,117	36·02	21,753	33·63	11,705	32·99	9,620	33·03	9,740	32·98	9,590
19	36·31	23,029	36·01	21,709	33·61	11,635	32·98	9,590	33·02	9,710	32·99	9,620
20	36·30	22,985	36·00	21,665	33·61	11,635	32·96	9,530	33·03	9,740	33·00	9,650
21	36·32	23,073	35·99	21,621	33·61	11,635	32·94	9,470	33·02	9,710	33·00	9,650
22	36·31	23,029	35·98	21,577	33·61	11,635	32·93	9,440	33·01	9,680	33·00	9,650
23	36·30	22,985	35·75	20,565	33·58	11,530	32·92	9,410	33·01	9,680	33·00	9,650
24	36·29	22,941	35·71	20,389	33·58	11,530	32·95	9,500	33·00	9,650	33·00	9,650
25	36·22	22,633	35·61	19,949	33·58	11,530	32·95	9,500	32·99	9,620	33·00	9,650
26	36·27	22,853	35·52	19,553	33·57	11,495	32·96	9,530	32·99	9,620	32·97	9,560
27	36·29	22,941	35·46	19,289	33·47	11,495	32·96	9,530	32·98	9,590	32·94	9,470
28	36·33	23,117	35·42	19,113	33·57	11,495	32·97	9,560	32·98	9,590	32·92	9,410
29	36·38	23,337	35·29	18,541	33·56	11,460	32·97	9,560	32·97	9,560	32·91	9,380
30	36·43	23,557	35·17	18,013	33·56	11,460	32·97	9,560	32·97	9,560	32·92	9,410
31	36·44	23,601	35·04	17,441	...	...	32·98	9,590	...	...	32·94	9,470

MONTHLY DISCHARGE OF WINNIPEG RIVER AT SOUTH CHANNEL, WHITEDOG FALLS, FOR 1915.

[Drainage area 27,500 square miles.]

MONTH.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet
January	....	....	[1]9,500	....	....	584,100
February	....	....	[1]9,650	....	....	536,000
March	....	....	[1]9,700	....	....	596,400
April	....	....	[1]10,000	....	....	595,000
May	....	....	[1]15,000	....	....	922,400
June	19,553	18,541	19,031	....	....	1,132,400
July	23,689	19,817	22,774	....	....	1,400,300
August	23,689	17,441	21,496	....	....	1,321,800
September	16,605	11,460	12,269	....	....	730,100
October	11,355	9,410	9,922	....	....	610,100
November	9,950	9,500	9,686	....	....	576,400
December	9,650	9,380	9,530	....	....	586,000
The Year	23,689	....	13,213	....	....	9,591,000

NOTE.—Marked thus (1) Estimated. Discharge per square mile and Run-off Depth in inches omitted. The channel is one of two of the river at this point.

MONTHLY DISCHARGE OF WINNIPEG RIVER NEAR WHITEDOG FALLS, FOR 1915.

[Drainage area 27,500 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1] 9,830	0·321	0·370	604,400
February	....	....	[1] 10,020	0·364	0·379	556,500
March	....	....	[1] 10,080	0·367	0·423	619,800
April	....	....	[1] 10,450	0·380	0·424	621,800
May	....	....	[1] 15,700	0·571	0·658	965,400
June	20,583	19,517	20,029	0·728	0·812	1,191,800
July	24,973	20,864	24,002	0·873	1·007	1,475,800
August	24,973	18,342	22,648	0·824	0·950	1,392,600
September	17,454	11,966	12,832	0·467	0·521	763,600
October	11,853	9,749	10,304	0·375	0·432	633,600
November	10,336	9,847	10,049	0·365	0·407	598,000
December	10,010	9,717	9,880	0·359	0·414	607,500
The Year	24,973	......	13,819	0·500	6·797	10,030,800

NOTE.—Marked thus (1) Estimated. This table gives the total combined discharges, Run-off, etc., for the North and South Channels at Whitedog Falls.

WINNIPEG RIVER AT SLAVE FALLS.

HISTORY.

A number of meterings of the Winnipeg river were made by various interested parties between March, 1906, and October, 1911. These have all been referred to gauge heights in the tailrace of the City of Winnipeg Plant at Point du Bois, though they were taken at various points on the river. On October 1, 1911, a metering station was established at Slave falls by D. L. McLean. This is a cable station and has been operated on all measurements taken at this point since the above date. All meterings to the end of 1914 are referred to the gauge in the tailrace at Point du Bois.

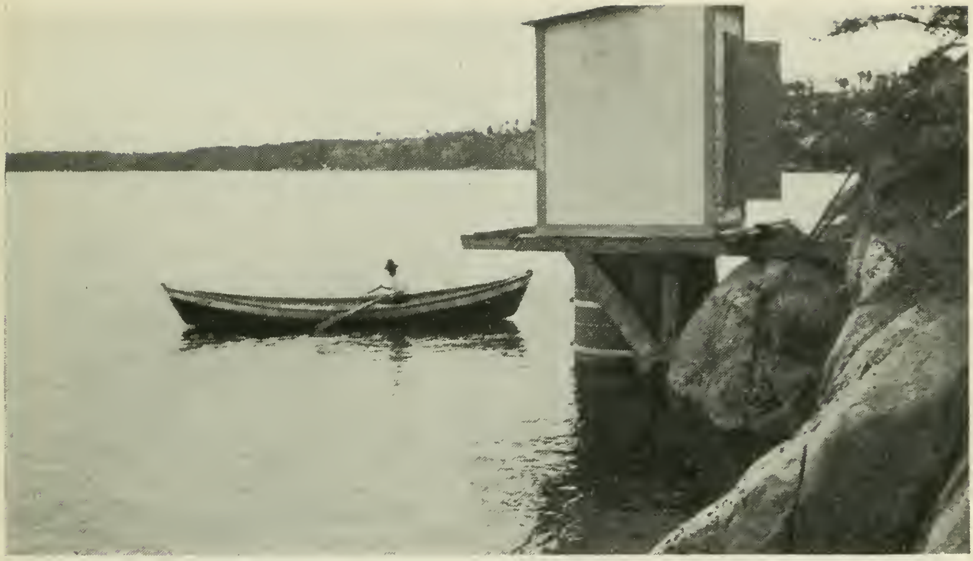
In June of 1915 a Gurley automatic water stage register was established above Slave falls. A relation between this gauge and the Point du Bois tailrace gauge has been obtained and all records for this station for the year 1915 refer to the stage at Slave falls.

LOCATION OF SECTION.

The metering section is located about two hundred and fifty feet above the crest of the Slave falls, which is about four miles below the City of Winnipeg's plant at Point du Bois. The I.P. is a chisel mark on the rock marked by paint, on the right bank near the cable carrier.

Taken by W. J. Ireland.

WINNIPEG RIVER—SLAVE FALLS—NEW TOWERS FOR METERING STATION.



Taken by W. J. Ireland.

WINNIPEG RIVER—SLAVE FALLS—AUTOMATIC GAUGE HOUSE.

RECORDS AVAILABLE.

By referring the meterings made to the Point du Bois gauge, continuous records of daily discharge have been computed from January of 1907 to the end of 1915.

DRAINAGE AREA.

The drainage area above Otter falls is 50,500 square miles, and above Slave falls the area is 49,700 square miles.

GAUGE.

A vertical staff gauge is located about seventy-five feet downstream from the section on the right bank. This gauge is referred to B.M. 189 A; a rock bench mark situated about twenty feet from the gauge.

The automatic gauge referred to above is located about four hundred feet above the meter section on the left bank, and is referenced to a brass cap bench mark bolted to the rock about thirty feet upstream from the gauge house.

CHANNEL.

The channel is straight for one hundred feet above and one hundred and fifty feet below the gauge at nearly all stages. The bed is of solid rock with a few large boulders at the left side of the section. It is permanent and all the water at all stages is confined to the section.

DISCHARGE MEASUREMENTS.

Discharge measurements have been taken covering practically the complete range in stage recorded since the establishment of the station. These measurements are made from a car travelling on a cable spanning the river at the section.

ACCURACY.

The discharge curve is well defined over the range in gauge height, both when plotted to the Slave falls and Point du Bois gauges. On account of the drop at the falls below the station there is no possibility of backwater effect. Also the section is an open water one at all seasons, so that the open water rating applies the year round. The section is a very favorable one and the accuracy of the records is high

Taken by W. J. Ireland.

WINNIPEG RIVER—SLAVE FALLS—PUTTING WOOD CASING ON WELL FOR AUTOMATIC GAUGE.

Discharge Measurements of Winnipeg River at Slave Falls, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.	
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	Automatic Gauge.	Point du Bois Tailrace Gauge.
Feb. 19.	M. S. Madden...	1,462	255	6,410	2·70	18·20	17,287	918·40	929·21
20.	“ ...	1,462	255	6,410	2·70	18·15	17,296	918·26	929·13
April 26.	A. Pirie.........	1,939	267	7,020	3·23	19·97	22,669	920·11	930·23
June 15.	W. J. Ireland....	1,939	278	7,653	4·11	22·57	31,467	922·75	931·80
July 15.	E. B. Patterson..	1,919	295	8,063	4·59	23·63	37,008	923·96	932·50
16.	“ ...	1,919	295	8,075	4·58	23·67	36,986	923·95	932·50
17.	“ ..	1,919	295	8,058	4·59	23·61	36,986	923·92	932·50
24.	“ ..	1,919	295	8,043	4·53	23·56	36,437	923·96	932·58
26.	“ ..	1,919	295	8,079	4·59	23·68	37,081	923·98	932·59
31.	“ ..	1,919	295	8,058	4·45	23·61	35,858	923·91	932·53
Aug. 2.	“ ..	1,919	295	8,095	4·61	23·74	37,319	924·02	932·55
3.	“ ..	1,919	295	8,070	4·62	23·65	37,284	923·94	932·58
4.	“ ..	1,919	295	8,061	4·59	23·62	37,002	923·89	932·55
5.	“ ..	1,919	295	8,061	4·61	23·60	37,159	923·88	932·53
6.	“ ..	1,919	295	8,061	4·57	23·60	36,837	923·88	932·50
7.	“ ..	1,919	295	8,061	4·55	23·61	36,678	923·89	932·53
17.	“ ..	1,919	294	7,978	4·50	23·34	35,903	923·64	932·35
18.	“ ..	1,919	294	7,947	4·47	23·23	35,523	923·51	932·28
19	“ ..	1,919	294	7,935	4·47	23·19	35,472	923·48	932·18
20.	“ ..	1,919	294	7,918	4·42	23·13	34,999	923·39	932·15
21.	“ ..	1,919	294	7,896	4·40	23·05	34,744	923·32	932·10
24.	“ ..	1,919	292	7,825	4·31	22·81	33,725	923·06	931·88
25.	“ ..	1,919	292	7,791	4·28	22·70	33,346	922·94	931·83
26.	“ ..	1,919	291	7,743	4·22	22·54	32,675	922·79	931·75
27.	“ ..	1,919	290	7,675	4·12	22·30	31,622	922·53	931·58
28.	“ ..	1,919	290	7,637	4·06	22·16	31,005	922·35	931·43
30.	“ ..	1,919	288	7,514	3·93	21·72	29,532	921·93	931·15
31.	“ ..	1,919	287	7,427	3·78	21·41	28,075	921·59	931·08
Sept. 1.	“ ..	1,919	272	7,370	3·70	21·21	27,270	921·37	930·93
4.	“ ..	1,919	270	7,235	3·56	20·71	25,756	920·87	930·68
6.	“ ..	1,919	270	7,181	3·47	20·51	24,919	920·67	930·53
7.	“ ..	1,919	269	7,172	3·46	20·48	24,816	920·63	930·61
9.	“ ..	1,919	269	7,137	3·41	20·35	24,339	920·48	930·56
10.	“ ..	1,919	268	7,108	3·37	20·24	23,954	920·37	930·43
16.	“ ..	1,919	265	7,035	3·27	19·97	23,005	920·11	930·23
17.	“ ..	1,919	264	7,008	3·21	19·87	22,497	919·99	930·25
Oct. 29.	W. J. Ireland....	1,940	261	6,787	2·92	19·02	19,819	919·12	929·73

Daily Gauge Height and Discharge of Winnipeg River at Slave Falls, for 1915.

[Drainage area 49,700 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	18·76	18,662	18·71	18,501	18·13	16,648	17·63	15,073	20·31	23,778	22·72	32,435
2	18·80	18,791	18·85	18,952	18·18	16,807	17·63	15,073	20·36	23,947	22·67	32,248
3	18·71	18,501	18·80	18,791	18·04	16,362	17·59	14,948	20·56	24,627	22·63	32,098
4	18·80	18,791	18·57	18,050	18·13	16,648	17·46	14,543	20·53	24,524	22·67	32,248
5	18·76	18,662	18·52	17,889	18·01	16,267	17·59	14,948	20·56	24,627	22·58	31,910
6	18·71	18,501	18·47	17,730	17·96	16,109	17·68	15,230	20·61	24,800	22·29	30,823
7	18·68	18,405	18·18	16,807	18·01	16,267	17·63	15,073	20·78	25,385	22·67	32,248
8	18·55	17,986	18·38	17,443	18·01	16,267	17·68	15,230	20·73	25,214	22·68	32,285
9	18·47	17,730	18·35	17,348	18·01	16,267	17·63	15,073	20·70	25,110	22·72	32,435
10	18·47	17,730	18·38	17,443	17·96	16,109	17·68	15,230	21·23	26,959	22·72	32,435
11	18·63	18,244	18·30	17,189	18·01	16,267	17·63	15,073	21·37	27,455	22·75	32,548
12	18·60	18,147	18·35	17,348	17·92	15,984	17·87	15,827	21·57	28,170	22·68	32,285
13	18·55	17,986	18·23	16,966	17·96	16,109	17·87	15,827	21·66	28,497	22·67	32,248
14	18·60	18,147	18·06	16,426	17·87	15,827	17·87	15,827	21·71	28,679	22·75	32,548
15	18·63	18,244	18·30	17,189	17·92	15,984	18·09	16,521	21·71	28,679	22·75	32,548
16	18·60	18,147	18·35	17,348	17·87	15,827	18·30	17,189	21·45	27,738	22·75	32,548
17	18·47	17,730	18·30	17,189	17·84	15,733	18·38	17,443	21·71	28,679	22·82	32,810
18	18·52	17,889	18·43	17,602	17·79	15,576	18·35	17,348	21·62	28,352	22·80	32,735
19	18·63	18,244	18·40	17,507	17·76	15,481	18·71	18,501	21·71	28,679	22·75	32,548
20	18·63	18,244	18·26	17,062	17·71	15,324	18·97	19,338	21·71	28,679	22·75	32,548
21	18·57	18,050	18·01	16,267	17·68	15,230	19·02	19,500	21·71	28,679	22·82	32,810
22	18·52	17,889	18·21	16,903	17·84	15,733	19·19	20,056	21·71	28,679	22·74	32,510
23	18·43	17,602	18·35	17,348	17·87	15,827	19·39	20,710	21·79	28,971	22·82	32,810
24	18·21	16,903	18·30	17,189	17·84	15,733	19·60	21,402	21·94	29,517	22·82	32,810
25	18·63	18,244	18·30	17,189	17·71	15,324	19·60	21,402	22·16	30,335	22·86	32,960
26	18·73	18,565	18·35	17,348	17·71	15,324	20·11	23,102	22·33	30,973	22·90	33,110
27	18·63	18,244	18·30	17,189	17·68	15,230	20·06	22,933	22·65	32,173	22·87	32,998
28	18·85	18,952	17·96	16,109	17·54	14,791	20·11	23,102	22·58	31,910	22·96	33,335
29	18·80	18,791	....	....	17·68	15,230	20·15	23,237	22·58	31,910	22·91	33,148
30	18·85	18,952	....	....	17·63	15,073	20·20	23,406	22·50	31,610	23·03	33,598
31	18·40	17,507	....	....	17·59	14,948	....	....	22·67	32,248	....	....

	July.		August.		September.		October.		November.		December.	
1	22·94	33,260	23·89	36,823	21·40	27,561	19·96	22,597	19·30	20,416	19·69	21,701
2	23·06	33,710	23·99	37,198	21·24	26,995	19·96	22,597	19·22	20,154	19·72	21,800
3	23·09	33,823	23·96	37,085	21·08	26,428	19·83	22,166	19·30	20,416	19·72	21,800
4	23·10	33,860	23·94	37,010	20·89	25,765	19·91	22,431	19·28	20,351	19·72	21,800
5	23·25	34,423	23·91	36,898	20·75	25,283	19·83	22,166	19·31	20,449	19·66	21,601
6	23·31	34,648	23·92	36,935	20·74	25,248	19·77	21,966	19·28	20,351	19·85	22,232
7	23·36	34,835	23·89	36,823	20·73	25,214	19·59	21,369	19·22	20,154	19·75	21,900
8	23·45	35,173	23·90	36,860	20·65	24,938	19·55	21,236	19·36	20,612	19·74	21,867
9	23·54	35,510	23·94	37,010	20·51	24,455	19·57	21,302	19·59	21,369	19·78	22,000
10	23·61	35,773	23·95	37,048	20·43	24,183	19·41	20,776	19·69	21,701	19·78	22,000
11	23·65	35,923	23·90	36,860	20·32	23,812	19·39	20,710	19·62	21,468	19·73	21,834
12	23·82	36,560	23·85	36,673	20·24	23,541	19·45	20,907	19·61	21,435	19·65	21,568
13	23·82	36,560	23·81	36,523	20·33	23,845	19·36	20,612	19·62	21,468	19·76	21,933
14	23·87	36,748	23·75	36,298	20·22	23,474	19·30	20,416	19·58	21,336	19·59	21,369
15	23·94	37,010	23·67	35,998	20·19	23,372	19·27	20,318	19·74	21,867	19·74	21,867
16	23·98	37,160	23·72	36,185	20·13	23,169	19·22	20,154	19·68	21,668	19·83	22,166
17	23·96	37,085	23·61	35,773	20·08	23,000	19·16	19,958	19·69	21,701	19·82	22,132
18	23·95	37,048	23·55	35,548	20·08	23,000	19·32	20,481	19·68	21,668	19·81	22,099
19	24·03	37,348	23·48	35,285	20·00	22,730	19·27	20,318	19·61	21,435	19·74	21,867
20	23·99	37,198	23·42	35,060	19·99	22,697	19·20	20,089	19·60	21,402	19·90	22,398
21	23·97	37,123	23·34	34,760	19·99	22,697	19·20	20,089	19·48	21,005	19·86	22,265
22	23·96	37,085	23·26	34,460	20·01	22,764	19·21	20,122	19·73	21,834	19·87	22,298
23	23·95	37,048	23·31	34,648	19·96	22,597	19·21	20,122	19·70	21,734	19·83	22,166
24	23·92	36,935	23·09	33,823	19·97	22,630	19·13	19,860	19·69	21,701	19·85	22,232
25	23·87	36,748	22·94	33,260	20·09	23,034	19·31	20,449	19·64	21,535	19·81	22,099
26	23·95	37,048	22·75	32,548	19·93	22,498	19·17	19,991	19·68	21,668	19·85	22,232
27	23·90	36,860	22·56	31,835	20·12	23,136	19·26	20,285	19·67	21,634	19·85	22,232
28	23·87	36,748	22·30	30,860	20·03	22,831	19·24	20,220	19·53	21,170	19·74	21,867
29	23·87	36,748	21·97	29,626	20·00	22,730	19·22	20,154	19·71	21,767	19·73	21,834
30	23·87	36,748	21·89	29,335	19·98	22,664	19·26	20,285	19·68	21,668	19·76	21,933
31	23·88	36,785	21·63	28,388	.....	.....	19·17	19,991	.....	.....	19·83	22,166

MONTHLY DISCHARGE OF WINNIPEG RIVER AT SLAVE FALLS, FOR 1915.
[Drainage area 49,700 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet.
January	18,952	16,903	18,209	0·366	0·422	1,119,700
February	18,952	16,109	17,369	0·349	0·363	964,600
March	16,807	14,791	15,816	0·318	0·367	972,500
April	23,406	14,543	17,939	0·361	0·403	1,067,400
May	32,248	23,778	28,051	0·564	0·650	1,724,800
June	33,958	30,823	32,554	0·655	0·731	1,937,100
July	37,348	33,260	36,114	0·727	0·838	2,220,600
August	37,198	28,388	34,950	0·703	0·814	2,149,000
September	27,561	22,498	23,876	0·480	0·536	1,420,700
October	22,597	19,860	20,779	0·420	0·484	1,277,700
November	21,867	20,154	21,238	0·427	0·477	1,263,800
December	22,398	21,369	21,976	0·442	0·510	1,351,300
The Year	37,348	14,543	24,072	0·484	6·595	17,469,200

PINAWA CHANNEL, BELOW CONTROL DAM.

HISTORY.

The Pinawa channel was a high water or back channel of the Winnipeg river, and was utilized as a diverting channel for a power house built about nine miles below the inlet by the Winnipeg Electric Railway Company. At first the plant depended upon the stage of the river for water down this channel, but the rapid growth of the load necessitated the building of a diverting dam in the main river to ensure sufficient flow down the Pinawa channel. Meterings were made below the control dam by engineers of the Company from 1907-1911. In May, 1912, a boat station was established on the Pinawa channel by Mr. A. M. Beale, for the purpose of collecting discharge data, and from that date records have been obtained at this station. In June of 1915 a cable station was installed to take the place of the boat station on practically the same section.

LOCATION OF SECTION.

The station is about two hundred feet below the control dam and six miles above the Winnipeg Electric Railway's plant on the Pinawa channel. The I.P. is a point chiselled in the rock on the left bank of the channel and referenced by a rock painted, "I.P."

RECORDS AVAILABLE.

A daily gauge record was obtained at the control dam by the Winnipeg Electric Railway Co. from April 28, 1906, to the end of 1914. The records are not continuous but cover the greater part of the period, and have been placed at the disposal of the Manitoba Hydrometric Survey. The records of a Gurley automatic water stage register installed by this Survey in June of 1914 are also available.

Daily discharge estimates based upon a curve plotted from discharge measurements taken between 1907 and 1911 are available. These cover the period of the years from May to October (the open water months). On account of back water due to ice jams in the channel below, estimates have not been made for the winter months.

GAUGE.

A vertical staff gauge bolted to the upstream side of the control dam was set in place by the Winnipeg Electric Railway Co., and it is this gauge to which records are referred. This gauge is referred to W.P.S. datum.

In May of 1915 a Gurley automatic water stage register was installed on the upstream side of the control dam close to the right bank, and from May 13 the records of this gauge are available. The gauge is referred to W.P.S. datum.

Taken by W. J. Ireland.

Pinawa Channel—Cable Station Below Control Dam.

CHANNEL.

The channel is straight for one hundred feet above the section and the same distance below; the section is regular, being a rock cut channel, the water being confined to the channel at all stages.

DISCHARGE MEASUREMENTS.

Discharge measurements have been taken at frequent intervals since the establishment of the station, numbering in all, sixty, and covering a range of four feet in gauge height.

DIVERSIONS.

All the water passing through the dam passes the section but there is a diversion channel just above the dam down which water may be diverted.

ACCURACY.

For the earlier years the discharge curve is well defined, but since the power station has been heavily loaded the load fluctuations may be noticed at the section making estimates of discharge rather susceptible to error.

DISCHARGE MEASUREMENTS OF PINAWA CHANNEL BELOW CONTROL DAM, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Feb. 11	C. O. Allen	1,911	131	1,725	4·71	95·25	8,130
11	“	1,911	131	1,732	5·24	95·30	9,081
22	M. S. Madden	1,462	131	1,661	5·08	94·86	8,433
23	“	1,462	131	1,673	5·12	94·99	8,566
24	“	1,462	131	1,673	5·09	94·97	8,509
25	“	1,462	131	1,673	5·12	94·90	8,570
26	“	1,462	131	1,660	5·12	94·86	8,504
May 26	A. Pirie	1,939	129	1,770	6·18	95·99	[1]10,949
June 19	W. J. Ireland	1,939	130	1,803	5·80	95·80	[1]10,461
20	E. B. Patterson	1,919	130	1,768	5·98	96·07	[1]10,570
21	“	1,919	130	1,768	5·98	96·07	[1]10,570
22	“	1,919	130	1,768	6·04	96·07	[1]10,676
22	“	1,919	130	1,768	6·06	96·07	[1]10,712
Aug. 12	“	1,919	130	1,762	6·09	96·05	[1]10,732
13	“	1,919	130	1,760	5·98	96·03	10,523
14	“	1,919	130	1,758	6·06	96·02	10,656
14	“	1,919	130	1,758	6·08	96·01	10,691
14	“	1,919	130	1,757	6·00	96·01	10,543
Sept. 2	“	1,919	130	1,679	5·86	95·40	9,842
11	“	1,919	130	1,643	5·81	95·10	9,847
11	“	1,919	130	1,643	5·83	95·10	9,580
13	“	1,919	130	1,642	5·80	95·09	9,527
13	“	1,919	130	1,643	5·85	95·10	9,612
Nov. 3	M. S. Madden	1,469	130	1,651	5·23	94·92	8,636

[1] New cable station.

NOTE.—Gauge heights are those read on the upstream side of the Control Dam.

DAILY GAUGE HEIGHT AND DISCHARGE OF PINAWA CHANNEL AT CONTROL DAM, FOR 1915.

Day	January.		February.		March.		April.		May		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	16.45	......	16·05	......	14·85	......	14·24	8,325	......	......	15·97	10,570
2	16·25	......	16·05	......	14·95	......	14·24	8,325	......	......	15·98	10,580
3	16·35	......	15·95	......	14·95	......	14·24	8,325	......	......	15·96	10,555
4	16·15	......	15·65	......	14·85	......	14·24	8,325	......	......	15·87	10,430
5	15·85	......	15·55	......	14·85	......	14·24	8,325	......	......	15·83	10,395
6	15·85	......	15·55	......	14·75	......	14·24	8,325	......	......	15·80	10,335
7	15·45	......	15·55	......	14·75	......	14·24	8,325	......	......	15·81	10,350
8	15·55	......	15·55	......	14·75	......	14·24	8,325	......	......	15·83	10,375
9	15·55	......	15·55	......	14·75	......	14·34	8,450	......	......	15·84	10,390
10	15·35	......	15·35	......	14·65	......	14·34	8,450	......	......	15·85	10,400
11	15·35	......	15·19 15·24	8,130[1] 9,081[1]	14·55	......	14·34	8,450	......	......	15·84	10,390
12	15·05	......	15·25	......	14·55	......	14·34	8,450	......	......	15·84	10,390
13	15·05	......	15·15	......	14·55	......	14·34	8,450	15·43	9,835	15·84	10,390
14	15·05	......	15·15	......	14·55	......	14·34	8,450	15·43	9,835	15·84	10,390
15	15·05	......	15·15	......	14·55	......	14·34	8,450	15·44	9,850	15·85	10,400
16	15·15	......	15·15	......	14·45	......	14·44	8,575	15·41	9,810	15·83	10,375
17	15·25	......	15·15	......	14·45	......	14·54	8,700	15·43	9,835	15·84	10,390
18	15·25	......	15·05	......	14·45	......	......	......	15·45	9,860	15·84	10,390
19	15·25	......	15·05	......	14·45	......	......	......	15·45	9,860	15·83	10,375
20	15·45	......	14·95	......	14·35	......	......	......	15·45	9,860	15·84	10,390
21	15·65	......	14·95	......	14·35	......	......	......	15·59	10,050	15·82	10,360
22	15·75	......	14·80	8,433[1]	14·35	......	......	......	15·66	10,140	15·81	10,345
23	15·75	......	14·93	8,566[1]	14·35	......	......	......	15·73	10,240	15·82	10,360
24	15·85	......	14·91	8,509[1]	14·35	......	......	......	15·79	10,320	15·82	10,360
25	15·85	......	14·84	8,570[1]	14·35	......	......	......	15·85	10,400	15·85	10,400
26	15·85	......	14·80	8,504[1]	14·35	......	......	......	15·88	10,445	15·86	10,415
27	15·85	......	14·75	......	14·24	8,325	......	......	15·93	10,510	15·85	10,400
28	15·95	......	14·85	......	14·24	8,325	......	......	15·95	10,540	15·84	10,390
29	16·05	......	......	......	14·24	8,325	......	......	15·95	10,540	15·85	10,400
30	16·25	......	......	......	14·24	8,325	......	......	15·96	10,555	15·86	10,415
31	16·05	......	......	......	14·24	8,325	......	......	15·97	10,570	......	......

	July.		August.		September.		October.		November.		December.	
1	15·86	10,415	16·01	10,625	15·41	9,810	15·03	9,315	14·81	9,035	14·97	......
2	15·87	10,430	16·01	10,625	15·38	9,770	15·02	9,300	14·83	9,065	14·99	......
3	15·88	10,445	16·02	10,640	15·33	9,700	15·00	9,275	14·85	9,090	15·05	......
4	15·88	10,445	16·01	10,625	15·28	9,635	14·97	9,240	14·84	9,075	15·02	......
5	15·90	10,470	16·01	10,625	15·24	9,580	14·99	9,265	14·85	9,090	15·01	......
6	15·92	10,500	15·99	10,595	15·22	9,555	14·97	9,240	14·84	9,075	15·22	......
7	15·94	10,525	16·00	10,610	15·22	9,555	14·91	9,160	14·85	9,090	15·52	......
8	15·95	10,540	16·00	10,610	15·21	9,545	14·90	9,150	14·87	9,115	15·63	......
9	16·01	10,625	16·00	10,610	15·16	9,480	14·92	9,175	14·90	9,150	15·76	......
10	16·02	10,640	16·01	10,625	15·12	9,425	14·88	9,125	14·98	9,250	15·69	......
11	16·00	10,610	16·01	10,625	15·09	9,385	14·85	9,090	14·95	9,215	15·78	......
12	16·01	10,625	16·00	10,610	15·09	9,385	14·87	9,115	14·94	9,200	15·94	......
13	16·01	10,625	15·98	10,580	15·08	9,375	14·87	9,115	14·95	9,215	16·03	......
14	16·02	10,640	15·98	10,580	15·07	9,360	14·85	9,090	14·95	9,215	16·09	......
15	16·04	10,665	15·96	10,555	15·06	9,350	14·82	9,050	14·95	9,215	16·15	......
16	16·03	10,650	15·96	10,555	15·03	9,315	14·81	9,035	14·94	9,200	16·15	......
17	16·03	10,650	15·96	10,555	15·04	9,325	14·81	9,035	14·93	9,190	16·11	......
18	16·02	10,640	15·93	10,515	15·02	9,300	14·81	9,035	14·93	9,190	15·95	......
19	16·02	10,640	15·92	10,500	15·03	9,315	14·81	9,035	14·92	9,175	15·77	......
20	16·02	10,640	15·90	10,470	15·01	9,290	14·81	9,035	14·91	9,165	15·81	......
21	16·02	10,640	15·89	10,455	15·01	9,290	14·79	9,015	14·91	9,165	15·96	......
22	16·02	10,640	15·87	10,430	15·02	9,300	14·82	9,050	14·95	9,215	15·91	......
23	16·02	10,640	15·88	10,445	15·00	9,275	14·82	9,050	14·95	9,215	15·99	......
24	16·02	10,640	15·84	10,390	15·03	9,315	14·82	9,050	14·95	9,215	16·11	......
25	16·01	10,625	15·79	10,320	15·04	9,325	14·79	9,015	14·97	9,210	16·22	......
26	16·01	10,625	15·75	10,270	15·04	9,325	14·81	9,035	14·98	9,250	16·34	......
27	16·01	10,625	15·71	10,215	15·05	9,335	14·82	9,050	14·99	9,265	16·37	......
28	16·00	10,610	15·64	10,120	15·05	9,335	14·81	9,035	14·98	9,250	16·39	......
29	15·99	10,595	15·57	10,025	15·05	9,335	14·81	9,035	14·98	9,250	16·44	......
30	16·00	10,610	15·53	9,970	15·03	9,315	14·85	9,090	15·00	9,275	16·42	......
31	16·00	10,610	15·48	9,905	......	......	14·81	9,035	......	......	16·30	......

NOTE.—Automatic Gauge.
Discharge Measurements marked (1) actual meterings.
Zero = 880·00 W.P.S. Datum.
Where discharges are omitted opposite gauge readings ice conditions obtain.

Monthly Discharge of Pinawa Channel at Control Dam for the Year 1915.

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches of Drainage Area.	Total in acre-feet.
January						
February						
March						
April			[1]8,413			
May			[2]1,0161			
June	10,580	10,335	10,403			
July	10,665	10,415	10,590			
August	10,640	9,905	10,461			
September	9,810	9,275	9,420			
October	9,315	9,015	9,108			
November	9,275	9,035	9,178			
December						
The period						

Note.—[1]Mean of first 17 days records of April.
[2]Mean of last 19 days records of May.

WHITEMOUTH RIVER.

The source of the Whitemouth river is in Whitemouth lake which lies in the South-eastern part of the province. The course of the river is generally North from the source to its junction with the Winnipeg river just below the Seven Sisters rapids on the latter stream.

The drainage area of the river is 1,566 square miles. The upper part of the river flows through that part of the country known as the Julius Muskeg, and as the name would imply is low and wet. The lower part of the valley is narrow, the land is fertile, and a considerable portion has been cleared and is now under cultivation. The lower two miles of the river flows through a well timbered belt of country, spruce, oak and poplar of merchantable size being plentiful.

The bed of the river is generally clay, but at the lower end rock ridges extend across the river bed and at one point form what is known as Whitemouth falls, which is near the mouth. The valley is generally from 30 to 50 feet in height, and the valley proper varies from 200 to 600 feet wide.

WHITEMOUTH RIVER AT WHITEMOUTH.

HISTORY.

The metering section was established at Whitemouth on the river of that name by G. H. Burnham on May 28, 1912.

LOCATION OF SECTION.

The station is located on the downstream side of the traffic bridge which crosses the river about nine hundred feet North-east of the C.P. Ry. station at Whitemouth. The I.P. is marked by three wire nails driven in the handrail of the bridge directly above the south abutment and the intervals are also marked on the handrail.

RECORDS AVAILABLE.

Daily gauge and discharge records are available from May 29, 1912, to the end of 1915 for the open water months. During the winters of 1912-13 and 1913-14 no gauge records were obtained, but during the winter of 1914-15 records are available.

DRAINAGE AREA.

The drainage area of the river above the station is 1,400 square miles. Much of this territory is low lying and of a swampy nature, lately it has been cross cut by the drainage system in connection with the construction of conduit for the Greater Winnipeg water supply, the Whitemouth being used as a discharge channel. This has noticeably affected the flow.

GAUGE.

A vertical staff gauge graduated to tenths is fastened to a pile of the bridge opposite station 91 of the section. It is referred to a B.M. consisting of an iron bolt sunk in a concrete pile near the bridge. An arbitrary datum is used.

CHANNEL.

The river is divided into six channels by the pile bents of the bridge. The bed is of clay and liable to slight shifting. The depth over the section under normal conditions averages four feet. The banks are not subject to overflow.

DISCHARGE MEASUREMENTS.

Sufficient meterings have been secured to define the discharge curve over a range of four feet in gauge height, for open water conditions. Under ice conditions a number have been taken but do not define the curve of discharge clearly. The measurements are made from the bridge.

ACCURACY.

The accuracy for the station curve is high over a range in gauge height of four feet, from 73·8 to 77·3.

DISCHARGE MEASUREMENTS OF WHITEMOUTH RIVER AT WHITEMOUTH, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 18...	C. O. Allen........	1,912	140	200	0·99	73·34	20[1]
Feb. 18...	M. S. Madden.....	1,462	111	162	0·06	73·28	10[1]
Mar. 17...	C. O. Allen........	1,912	110	179	0·14	73·29	24[1]
April 15...	M. S. Madden.....	1,462	142	582	0·65	74·36	378
May 5...	C. O. Allen........	2,018	151	705	1·13	75·13	796
May 12...	M. S. Madden.....	1,462	164	855	1·97	76·29	1,684
June 2...	"	1,469	137	560	0·66	74·39	370
June 22...	C. O. Allen........	2,018	144	685	1·14	75·12	781
July 14...	T. H. Boyd........	1,197	155	672	1·28	75·38	860
Aug. 5...	H. H. Pratt........	1,496	141	494	0·31	73·89	154
Aug. 11...	"	1,496	139	467	0·16	73·69	76
Aug. 17...	"	1,496	139	461	0·11	73·56	53
Sept. 17...	"	1,496	137	415	0·07	73·43	31
Nov. 25...	C. O. Allen.......	1,374	142	462	0·45	74·13	208[1]

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[1] Ice Measurement.

Daily Gauge Height and Discharge of Whitemouth River at Whitemouth for 1915.

[Drainage area 1,400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	73·42	....	73·24	....	73·29	....	73·34	....	75.50	1,030	74·43	395
2	73·40	....	73·24	....	73·28	....	73·35	....	75·72	1,190	74·39	375
3	73·40	....	73·24	....	73·28	....	73·41	....	75·74	1,210	74·32	340
4	73·40	....	73·24	....	73·28	....	73·70	....	75·73	1,200	74·29	326
5	73·40	....	73·24	....	73·27	....	73·69	....	75·17	817	74·26	312
6	73·38	....	73·24	....	73·28	....	73·70	....	75·19	829	74·27	317
7	73·38	....	73·24	....	73·27	....	73·71	....	75·83	1,280	74·25	308
8	73·38	....	73·24	....	73·28	....	74·69	....	76·31	1,680	74·39	375
9	73·38	....	73·24	....	73·27	....	74·71	....	76·34	1,710	74·39	375
10	73·35	....	73·24	....	73·28	....	74·79	....	76·29	1,660	74·40	380
11	73·35	....	73·24	....	73·29	....	74·85	....	76·31	1,680	75·25	865
12	73·35	....	73·24	....	73·27	....	74·90	....	76·35	1,720	75·28	883
13	73·35	....	73·24	....	73·28	....	74·93	673	76·31	1,680	75·26	871
14	73·35	....	73·26	....	73·29	....	74·44	400	76·19	1,580	75·20	835
15	73·35	....	73·26	....	73·28	....	74·39	375	76·07	1,470	75·24	859
16	73·32	....	73·26	....	73·29	....	74.40	380	76·06	1,470	75·29	889
17	73·30	....	73·26	....	73·30	....	74·41	385	76·06	1,470	75·35	928
18	73·30	20	73·28	10	73·29	....	74·42	390	76·06	1,470	75·41	967
19	73·30	....	73·29	....	73·34	....	74·41	385	75·43	981	75·38	947
20	73·30	....	73·29	....	73·34	....	74·40	380	75·39	954	75·29	889
21	73·30	....	73·29	....	73·34	....	74·39	375	75·27	877	75·15	805
22	73·30	....	73·28	....	73·30	....	74·34	350	75·26	871	75·09	769
23	73·30	....	73·29	....	73·29	....	74·44	400	75·21	841	75·08	763
24	73·29	....	73·29	....	73·32	....	75·07	757	75·03	733	75·09	769
25	73·27	....	73·30	....	73·40	....	75·51	1,040	74·93	673	75·08	763
26	73·27	....	73·29	....	73·39	....	75·50	1,030	74·89	649	75·09	769
27	73·27	....	73·30	....	73·38	....	75·49	1,020	74·79	590	75·46	1,000
28	73·27	....	73·29	....	73·39	....	75·71	1,180	74·72	551	75·45	995
29	73·27	....	....	....	73·31	....	75·72	1,190	74·69	535	75·46	1,000
30	73·26	....	....	....	73·30	....	75·71	1,180	74·62	496	75·19	829
31	73·24	....	....	....	73·31	....	....	....	74·56	463	....	....

	July.		August.		September.		October.		November.		December.	
1	75·12	787	74·10	240	73·33	27	73·99	193	74·04	214	74·04	....
2	75·03	733	74·09	236	73·32	26	74·05	219	74·10	240	74·05	....
3	74·82	607	74·06	223	73·32	26	74·09	236	74·07	227	74·02	....
4	74·86	631	73·99	185	73·33	27	74·09	236	74·06	223	74·00	....
5	74·84	619	73·94	172	73·39	30	74·11	245	74·03	210	73·97	....
6	74·82	607	73·93	168	73·32	26	74·12	249	74·01	201	73·85	....
7	74·69	535	73·92	164	73·32	26	74·28	321	74·06	223	73·82	....
8	74·59	480	73·91	160	73·31	25	74·29	325	74·16	227	73·82	....
9	74·59	480	[1]73·85	137	73·30	25	74·32	340	74·26	240	73·81	....
10	74·69	535	[1]73·75	98	73·34	27	74·44	350	74·44	240	73·80	....
11	74·68	529	73·67	73	73·36	28	74·30	330	74·79	240	73·80	....
12	75·41	967	73·63	63	73·36	28	74·31	335	74·76	245	73·80	....
13	75·41	967	73·60	55	73·38	29	74·30	330	74·71	....	73·80	....
14	75·31	902	73·54	45	73·39	30	74·25	307	74·65	....	73·78	....
15	[1]75·14	799	73·56	49	73·39	30	74·21	290	74·65	....	73·76	....
16	[1]74·97	697	73·54	45	73·39	30	74·19	281	74·54	....	73·73	....
17	[1]75·80	595	73·54	45	73·40	30	74·18	276	74·47	....	73·72	....
18	[1]75·63	502	73·50	39	73·40	30	74·18	276	74·41	....	73·70	....
19	[1]75·46	410	73·46	35	73·42	32	74·16	267	74·35	....	73·68	....
20	[1]75·29	326	73·44	34	73·42	32	74·16	267	74·32	....	73·65	....
21	[1]75·12	249	73·44	34	73·46	35	74·18	276	74·26	....	73·62	....
22	[1]73·95	177	73·44	34	73·46	35	74·19	281	[1]74·23	....	73·60	....
23	[1]73·78	110	73·40	30	73·52	42	74·17	272	[1]74·20	....	73·59	....
24	[1]73·61	58	73·37	29	73·52	42	74·10	240	[1]74·15	....	73·58	....
25	73·61	58	73·35	28	73·56	49	74·04	214	74·13	208	73·58	....
26	73·62	60	73·35	28	73·61	58	74·01	201	74·09	....	73·58	....
27	73·61	58	73·34	27	73·64	65	74.04	214	74·08	....	73.61	....
28	73·63	63	73·34	27	73·80	117	74·10	240	74·06	....	73·61	....
29	73·72	87	73·33	27	73·89	152	74·08	231	74·06	....	73·61	....
30	73·74	95	73·32	26	73·95	177	74·06	223	74·06	....	73·61	....
31	73·81	121	73·32	26	....	....	74·04	214			73.59	....

Gauge heights marked thus (1) Interpolated.
Ice conditions from January 1 to April 12 and from November 13 to December 31.
Not sufficient information to compute daily discharges.

Monthly Discharge of Whitemouth River at Whitemouth for the Year 1915.

[Drainage area 1,400 square miles.]

Month	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]18	0·013	0·015	1,100
February	....	....	[1]10	0·007	0·007	555
March	....	....	[1]10	0·007	0·008	615
April	....	....	[1]450	0·321	0·358	26,800
May	1,720	463	1,110	0·793	0·914	68,300
June	1,000	308	697	0·498	0·556	41,500
July	967	58	447	0·319	0·368	27,500
August	240	26	83	0·059	0·068	5,100
September	177	25	45	0·032	0·036	2,700
October	350	193	267	0·191	0·220	16,400
November	....	....	[1]210	0·150	0·167	12,500
December	....	....	[1]100	0·071	0·082	6,150
The Year	1,720	25	287	0·205	2·799	209,220

Note.—Marked thus ([1]) Estimated.

RED RIVER AND TRIBUTARIES.

RED RIVER.

Tht Red river, one of the most important flowing in the province of Manitoba, has its source near the central part of the State of Minnesota. It flows south and west to the town of Breckenbridge, then north to the International boundary, forming the boundary in that stretch between the States of Minnesota and North Dakota.

The general direction of the river from Breckenbridge to lake Winnipeg, into which body of water the river empties, is North, though the river itself is very sinuous in its course, nearly doubling its length between the points mentioned.

The drainage basin of the river is 116,347 square miles, of which 42,547 are in Minnesota and Dakota, 50,500 in Saskatchewan and 23,300 in Manitoba.

The valley of the river is not defined by high banks as in most cases, but the whole country slopes gently toward the river, which lies in a channel cut to a depth of from 25 to 50 feet below the plain.

The valley of the Red river is the oldest settled district in the Province, the land being practically all settled and farmed. Little standing timber is to be found, only clumps of elm and ash with poplar and cottonwood being found along the river.

The stream afforded the first means of access to the country, and was navigated for a number of years before the advent of the railways to the country between Grand Forks and lake Winnipeg. This traffic has however practically ceased to exist except upon the stretch of the river between Winnipeg and the lake. The Dominion Government have built a dam and lock near the mouth of the river, and by operating it an eight foot depth for navigation purposes is ensured between the lake and the city of Winnipeg.

There are a number of important centres which are located along the river. Among those within the province of Manitoba are:—Emerson, which is just north of the International boundary. Winnipeg, at the junction of the Assiniboine with the Red, and Selkirk, about 22 miles below Winnipeg. In addition to these a number of small communities are ocated along the banks of the river.

Metering stations have been located from time to time and maintained for certain periods at the following points along the river in the province of Manitoba:—

1. At the C.N.R. bridge at Emerson.
2. Three miles below Emerson.
3. At Elm Park bridge in Winnipeg.
4. At Redwood bridge in Winnipeg.

TRIBUTARIES.

The tributaries of the Red which enter that river within the province of Manitoba or close to its boundaries are:—

Pembina river.
Roseau river.
Rat river.
Morris river.
Assiniboine river.
Seine river.

Of these the Assiniboine is the most important and is given a separate section in this report. The others are considered along with the Red river; they enter it in the order given from source to mouth. Records of discharge for the Roseau and Rat are fairly continuous, but for the others only isolated meterings are available and are therefore listed under the head of miscellaneous meterings.

In the case of the Pembina, note should be made that this river flows partly through United States territory. Records of its discharge were kept by the United States Geological Survey at Neche, North Dakota, during the years 1903 to 1910 inclusive, and were included in Water Resources Paper No. 4.

RED RIVER AT EMERSON.

HISTORY.

The station was established by S. S. Scovil on May 3, 1912, and has been operated steadily from that date.

LOCATION OF SECTION.

The section at the time of the establishment of the station was located on the downstream side of the C.N.R. bridge at Emerson. The I.P. was at the intersection of the end post of the bridge with the wooden handrail on the left hand end of the bridge on the downstream side.

In the spring of 1914, the old bridge was replaced with a new one. On this new bridge the section is located on the downstream side, the I.P. being located on the west side of the east abutment. This change moved the location of the section approximately twelve feet downstream.

RECORDS AVAILABLE.

Daily gauge height records have been kept for each open water season since the station was established and intermittent readings under winter conditions have been obtained for the same period. A discharge curve for open water and winter conditions has been constructed and from it estimates of daily discharge have been arrived at.

DRAINAGE AREA.

The area tributary to the river above this station is 34,600 square miles and practically all of it is south of the International Boundary.

GAUGE.

A nine-foot vertical staff gauge is secured to the sheet piling around the west pier, twenty feet upstream from the section and is used for the lower stages of the river. The records of the upper stage of the river are observed on a gauge placed on the east side of the ice breaker on the upstream side of the bridge. Both of these gauges are referred to a permanent M.H.S. B.M. located on the left bank of the river about sixteen feet upstream from the west bridge abutment. This B.M. is set to M.H.S. datum.

CHANNEL.

The channel is divided by the bridge piers, otherwise it remains the same under all conditions. The bottom is hard clay inlaid with gravel. It is straight for four hundred feet above the station and five hundred feet below. The banks are high and not subject to overflow except under extraordinary conditions. The floods of 1879, 1882 and 1897 overflowed the banks.

DISCHARGE MEASUREMENTS.

Measurements are taken from the downstream side of the bridge except under winter conditions when they are taken from the ice.

ACCURACY.

A range in stage under open water conditions of 26.16 feet is covered, the discharge curve being well defined between gauge heights 749.0 and 765.0, beyond these limits the definition is not so good. Under ice conditions a discharge curve is well defined between the limits 749.0 and 751.5.

DISCHARGE MEASUREMENTS OF RED RIVER AT EMERSON, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 22	C. O. Allen	1,912	188	769	1·22	751·95	943[1]
May 13	E. B. Patterson	1,187	188	710	1·24	752·42	889[1]
Mar. 22	C. O. Allen	1,912	191	736	1·25	752·53	920[1]
April 14	T. J. Moore	1,435	294	4,283	2·40	762·19	10,279
May 20	C. O. Allen	2,018	264	2,190	2·09	756·19	4,576
June 14	"	2,018	242	1,521	1·67	753·31	2,540
July 8	T. H. Boyd	1,196	328	6,646	3·01	771·21	19,939
July 21	"	1,196	295	4,179	2·27	761·83	9,486
Aug. 19	"	1,196	237	1,416	1·62	753·06	2,310
Sept. 15	"	1,197	227	1,086	1·59	751·74	1,726

[1] Ice Cover.

DAILY GAUGE HEIGHT AND DISCHARGE OF RED RIVER AT EMERSON, FOR 1915.

[Drainage area 34,600 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft	Feet.	Sec. ft.
1	51·39	969	51·86	897	51·84	883	53·84	1,600	53·42	2,613	54·94	3,509
2	51·54	957	51·86	897	51·89	893	54·04	1,700	53·49	2,655	54·66	3,409
3	51·64	957	51·86	878	51·94	893	54·24	2,000	53·44	2,625	54·44	3,263
4	51·74	957	51·89	874	51·96	887	54·54	2,500	53·44	2,625	54·24	3,130
5	51·79	957	51·89	874	51·99	883	54·99	3,633	53·44	2,625	54·02	2,988
6	51·84	957	51·86	874	52·01	883	55·44	3,956	53·54	2,685	53·77	2,828
7	51·79	957	51·86	874	52·14	893	56·21	4,547	53·64	2,747	53.64	2,747
8	51·76	957	51·86	874	52·24	893	57·11	5,279	53·66	2,759	53·44	2,625
9	51·79	957	51·86	869	52·34	893	58·71	6,646	53·84	2,873	53·29	2,536
10	51·84	957	51·86	869	52·34	893	61·70	9,538	53·94	2,937	53·19	2,478
11	51·84	957	51·81	857	52·39	893	61·90	9,746	54·04	3,001	53·09	2,420
12	51·86	950	51·81	857	52·44	893	62·00	9,850	54·14	3,065	53·14	2,449
13	51·86	950	51·79	853	52·44	893	62·20	10,058	54·34	3,196	53·14	2,449
14	51·84	957	51·79	848	52·44	893	62·18	10,037	54·64	3,396	53·19	2,478
15	51·84	957	51·84	848	52·44	893	61·20	9,029	54·84	3,530	53·49	2,655
16	51·89	957	51·89	848	52·54	903	60·40	8,245	55·14	3,738	53·84	2,873
17	51·94	957	51·89	848	52·54	924	59·30	7,192	55·34	3,882	54·54	3,329
18	51·94	935	51·91	852	52·53	922	58·50	6,462	55·63	4,097	55·34	3,882
19	51·94	935	51·91	852	52·55	933	57·40	5,521	55·73	4,172	57·38	5,504
20	51·96	935	51·94	853	52·53	933	56·40	4,699	56·10	4,459	58·68	6,619
21	51·94	935	51·94	853	52·56	950	55·64	4,104	56·63	4,885	59·53	7,411
22	51·94	913	51·96	857	52·58	960	54·94	3,599	57·18	5,337	60·20	8,052
23	51·91	913	51·96	860	52·68	1,008	54·64	3,396	57.38	5,504	60·70	8,536
24	51·94	913	51·96	869	52·79	1,057	54·34	3,196	57·23	5,379	60·90	8,732
25	51·94	913	51·94	874	52·81	1,076	54·04	3,001	57.01	5,196	61·00	8,830
26	51·94	913	51·91	887	52·86	1,120	53·84	2,873	56·70	4,942	60·85	8,683
27	51·91	907	51·89	903	52·94	1,179	53·64	2,747	56·33	4,643	60·70	8,536
28	51·89	913	51·86	897	53·04	1,216	53·49	2,655	56·08	4,443	60·70	8,536
29	51·89	903	....	....	53·24	1,316	53·39	2,595	55·83	4,248	61·20	9,029
30	51·89	903	....	....	53·42	1,400	53·39	2,595	55·51	4,007	63·10	10,002
31	51·87	899	....	....	53·64	1,500	....	....	55·23	3,803	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	64·90	12,918	56·78	5,008	52·34	2,004	51·78	1,701	51·99	1,815	52·39	1,550
2	66·70	14,844	56·40	4,699	52·34	2,004	51·74	1,680	51·99	1,815.	52·54	1,555
3	68·20	16,449	56·08	4,443	52·29	1,977	51·81	1,717	51·99	1,815	52·09	1,561
4	70·21	18,600	55·73	4,172	52·24	1,950	51·89	1,761	51·94	1,788	52·01	1,566
5	70·71	19,137	55·53	4,022	52·19	1,923	51·89	1,761	51·94	1,788	51·94	1,572
6	71·21	19,681	55·38	3,911	52·14	1,896	51·87	1,750	51·84	1,734	51·94	1,582
7	71·21	19,681	55·08	3,696	52·14	1,896	51·81	1,717	51·79	1,707	52·09	1,588
8	71·41	19,901	55·03	3,661	52·09	1,869	51·86	1,744	51·89	1,761	52·34	1,593
9	71·61	20,121	54·83	3,523	52·04	1,842	51·99	1,815	51·99	1,815	52·39	1,593
10	71·61	20,121	54·63	3,389	52·01	1,825	51·99	1,815	51·99	1,815	52·37	1,599
11	71·21	19,681	54·40	3,236	51·94	1,788	51·99	1,815	51·96	1,798	52·29	1,604
12	70·61	19,029	54·18	3,091	51·89	1,761	51·99	1,815	51·94	1,788	52·29	1,604
13	69·61	17,958	54·03	2,994	51·79	1,707	52·01	1,825	51·91	1,734	52·19	1,609
14	68·21	16,460	53·88	2,898	51·69	1,653	52·05	1,847	51·91	1,685	52·19	1,609
15	66·40	14,523	53·64	2,747	51·67	1,642	52·09	1,869	52·14	1,647	52·34	1,609
16	65·30	13,346	53·54	2,685	51·67	1,642	52·09	1,869	52·21	1,604	52·34	1,609
17	64·20	12,169	53·34	2,566	51·69	1,653	52·09	1,869	51·89	1,561	52·31	1,609
18	63·50	11,432	53·14	2,449	51·71	1,680	52·11	1,879	51·57	1,501	52·41	1,609
19	62·90	10,792	53·06	2,403	51·71	1,680	52·12	1,885	51·31	1,161	52·11	1,609
20	62·50	10,372	52·96	2,346	51·77	1,696	52·12	1,885	51·31	1,117	52·39	1,604
21	61·90	9,746	52·92	2,323	51·81	1,731	52·11	1,879	51·36	1,471	52·39	1,599
22	61·50	9,333	52·84	2,278	51·94	1,788	52·06	1,852	51·34	1,464	52·34	1,593
23	60·90	8,732	52·69	2,195	51·99	1,815	52·01	1,825	51·54	1,180	52·34	1,588
24	60·20	8,052	52·67	2,184	51·99	1,815	52·01	1,825	51·94	1,191	52·24	1,582
25	59·70	7,572	52·64	2,167	52·01	1,825	52·02	1,831	51·99	1,507	52·14	1,577
26	59·20	7,098	52·56	2,123	51·99	1,815	52·04	1,842	51·94	1,512	52·14	1,572
27	58·83	6,753	52·44	2,058	51·96	1,798	52·04	1,842	51·96	1,523	52·09	1,566
28	58·33	6,314	52·44	2,058	51·94	1,788	52·06	1,852	52·24	1,528	52·11	1,561
29	57·83	5,885	52·39	2,031	51·89	1,761	52·09	1,869	52·39	1,534	52·11	1,555
30	57·53	5,630	52·34	2,004	51·81	1,717	52·09	1,869	52·39	1,539	52·09	1,550
31	57·13	5,296	52·34	2,004			52·04	1,842			52·07	1,515

NOTE—Ice conditions from January 1 to April 4 and November 14 to December 31.
700·00 should be added to gauge heights to bring to Station Datum

MONTHLY DISCHARGE OF RED RIVER AT EMERSON, FOR THE YEAR 1915.

[Drainage area 34,600 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet
January..	969	899	938	0·027	0·031	57,700
February	903	848	868	0·025	0·026	48,200
March...	1,500	883	992	0·029	0·034	61,000
April...	10,058	1,600	5,097	0·147	0·164	303,300
May	5,504	2,613	3,744	0·108	0·124	230,200
June	10,002	2,420	5,020	0·145	0·162	298,700
July...	20,121	5,296	13,149	0·380	0·438	808,500
August..	5,008	2,004	2,947	0·085	0·098	181,200
September	2,004	1,642	1,798	0·052	0·058	107,000
October.	1,885	1,680	1,818	0·053	0·061	111,800
November.	1,815	1,447	1,638	0·047	0·052	97,500
December..	1,609	1,545	1,588	0·046	0·053	97,700
The Year	20,121	848	3,316	0·096	1·301	2,402,800

RED RIVER AT ELM PARK.

HISTORY.

The station was established by M. S. Madden on August 19, 1914, the object of establishing a station at this point was to secure some information regarding discharge with a view to making some determinations by slope measurements.

LOCATION OF SECTION.

The meter section is situated on the downstream side of Elm Park traffic bridge which crosses the Red river at Elm Park within the city limits of Winnipeg and about four and one-half miles above the junction of the Assiniboine and Red rivers. The I.P. of the section is marked on the wooden hand rail at the north end of the bridge on the downstream side.

RECORDS AVAILABLE.

Daily gauge height readings have been taken from August 19, 1914, on. A number of discharge measurements have also been secured.

The presence of the St. Andrews Dam in the Red river has a material effect upon the discharge measurements taken at this point, but one of the objects of establishing the station was to secure records over that period when the dam was opened. There have been no estimates made of daily discharge for this station.

DRAINAGE AREA.

The area tributary to the Red river above Elm Park bridge is 41,060 square miles.

GAUGE.

A nine foot vertical staff gauge was spiked to the wooden ice breaker opposite station 160 on the metering section. This was replaced on November 6 by a vertical staff gauge which was fastened to the concrete pier in midstream and just below the ice breaker. The gauge is referred to M.H.S. datum.

CHANNEL.

The channel is straight for 1,000 feet above the section and 1,500 feet below, the banks are high and not liable to overflow, the bed of the channel is composed of sand and clay and somewhat liable to shifting. The channel itself is divided into two channels by a centre bridge pier.

DISCHARGE MEASUREMENTS.

The discharge measurements are taken from the downstream side of the bridge.

ACCURACY.

Owing to the effect of the operation of the St. Andrews Dam, it has not been possible to construct a discharge curve for this station. Primarily the station was established with the object of making slope discharge experiments, under conditions obtaining when the dam was closed, but owing to the distance that the water is backed up beyond the station, sufficient fall could not be obtained in a stretch of several miles to render the results obtained at all reliable. When the dam is open the discharge measurements are quite reliable.

Discharge Measurements of Red River at Elm Park, Winnipeg, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 8...	C. O. Allen........	1,912	335	2,480	0·36	729·78	894[1]
8...	"	1,912	335	2,480	0·35	729·80	875[1]
16...	"	1,912	325	2,452	0·35	729·90	875[1]
April 2...	"	1,912	330	2,476	0·47	730·54	1,156
13...	T. J. Moore........	1,435	421	5,296	1·99	735·74	10,533
17...	"	1,435	408	5,098	1·96	735·19	9,984
30...	E. B. Patterson....	1,920	380	4,285	0·50	733·19	2,162
May 12...	T. J. Moore........	1,197	428	5,383	0·68	736·03	3,660
Aug. 12...	T. H. Boyd........	1,197	428	5,494	0·67	736·15	3,683

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[1] Ice measurement.

RED RIVER AT REDWOOD BRIDGE, WINNIPEG.

HISTORY.

A gauge was set on the Red River at the Redwood bridge in the City of Winnipeg on August 21, 1912, by G. H. Burnham, in connection with the work of the Red River survey, and from that time intermittent gauge readings have been obtained at this point.

LOCATION OF GAUGE.

The Redwood bridge crosses the Red River on Redwood Ave. in the City of Winnipeg about three miles downstream from the junction of the Red and Assiniboine rivers.

The gauge is located inside the ice breaker and facing the upstream side of the bridge, and is referenced to a B.M. set to M.H.S. datum, on the top of the bridge pier adjacent to the gauge.

RECORDS AVAILABLE.

Intermittent gauge readings have been obtained on this gauge from the time of installation to the end of the year 1915.

RED RIVER AT MORRIS.

HISTORY.

A gauge was established on the Red river at the town of Morris on May 1, 1914, by A. Pirie, and from that date gauge readings have been obtained at this point.

LOCATION OF GAUGE.

A twelve-foot staff gauge has been secured to a rod driven into the bed of the stream at a point directly below the C.N.R. pump house on the left bank of the river and about six hundred feet below the pontoon bridge.

The gauge is referred to a permanent M.H.S. B.M. set to M.H.S. datum and located behind the C.N.R. pump house.

RECORDS AVAILABLE.

· Continuous records of daily gauge readings have been obtained from the time of installation of the gauge, May 1, 1914, to November 21, 1915.

RED RIVER AT ST. AGATHE.

HISTORY.

A gauge was set on the Red river at St. Agathe by A. Pirie on May 1, 1914, and except during times of interference during high water records have been obtained since that time.

LOCATION OF GAUGE.

A nine-foot enamelled staff gauge has been secured to a rod driven into the bed of the stream close to the left bank, two hundred feet downstream from the ferry. The gauge is referred to a permanent M.H.S. B.M. set to M.H.S. datum and located at top of bank near the gauge.

RECORDS AVAILABLE.

Gauge records are available from May 1 to December 31, 1914, from January 1 to April 2, from May 10 to June 30, and from July 21 to November 12, 1915.

ROSEAU RIVER.

The Roseau river is the largest tributary entering the Red river from the east within the Province of Manitoba. The mouth of the Roseau is about 12 miles north of the International boundary and it drains the territory lying to the west and south of the Lake of the Woods.

The general direction followed by the Roseau is northwest, but the actual course of the river is very sinuous, about half of its length lying in United States territory. The banks of the river vary from ten to twelve feet in height and are cut sharply down from the prairie level. The river bottom and banks are composed chiefly of heavy clay.

The drainage area is 1,987 square miles, 890 square miles being in Manitoba and 1,097 square miles in the State of Minnesota. A large part of the drainage area is under cultivation, there being little standing timber in that part within the province. What there is consists mostly of elm, ash and oak, very little of which is of commercial size.

Considerable drainage work has been done in the basin, especially on the United States side of the line. There are no towns of any size to be found along the river, but three small villages are so located; these are Sprague, near the International boundary on the Ridgeville branch of the C.N.R., Stuartburn on the same line and Dominion City located at the crossing of the Emerson branch of the C.P.R. Dominion City has a population of about 200.

Discharge measurements have been made at various sections on the river since the establishment of the Survey in 1912. The sections were used and then abandoned in favor of more suitable ones for various reasons and are as follows:—

1. At Dominion City.
2. At Baskerville's Farm.
3. At Mayne's Farm.
4. Below Dominion City, in use at present.

The records and results obtained at these stations follow.

ROSEAU RIVER AT STUARTBURN.

HISTORY.

On May 7, 1915, a metering station was established on the Roseau river at Stuartburn, Manitoba, by A. Pirie, and the station was operated throughout the open water season of that year.

LOCATION OF SECTION.

The station established by A. Pirie was located on the downstream side of the C.N. Ry. bridge about five hundred yards east of Stuartburn station. On June 6 a section was chosen two hundred and eighty-five feet downstream from the above mentioned bridge and at this point a cable carrier station was established. The Initial Point is a large permanent hub placed between the left bank cable support and the water's edge.

RECORDS AVAILABLE.

From the time of the installation of the gauge on May 7, continuous records of gauge readings are available up to November 15 of the same year, at which time ice cover conditions were met with.

Discharge measurements were taken at various times thoughout this period, covering a range in stage of 3·3 feet, and from these estimated daily discharges have been computed.

DRAINAGE AREA.

The drainage area tributary to the river at this point is 1,520 square miles.

GAUGE.

A nine-foot staff gauge secured to a two by four inch scantling driven into the bed of the stream near the left bank at the C.N.R. bridge. The gauge is referred to a permanent M.H.S. B.M. set to an arbitrary datum and located about sixty-five feet northwest of west end of bridge.

CHANNEL.

The bed of the stream is composed of sandy silt and liable to shift during flood. The banks at the section are high and not liable to overflow.

DISCHARGE MEASUREMENTS.

All discharge measurements since the discontinuance of the bridge station are made from a traveller suspended from a cable from which the meter is lowered into the stream at the points of measurement.

ACCURACY.

The discharge curve for the range in stage covered by the discharge measurements is fairly well defined.

DISCHARGE MEASUREMENTS OF ROSEAU RIVER NEAR STUARTBURN, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
May 7.	A. Pirie.	1,939	85	451	1·65	94·73	747	At C.N.R. Bridge
May 18	C. O. Allen	2,018	88	512	1·82	95·26	932	" "
June 15.	"	2,018	86	463	1·65	94·81	763	" "
July 6.	T. H. Boyd. .	1,197	91	486	1·87	95·62	908	Cable section
July 7.	"	1,197	91	486	1·96	95·64	952	" "
Aug. 17.	"	1,197	81	258	0·43	92·94	111	" "
Sept. 16	"	1,197	81	206	. . . .	92·33		No discharge
Sept. 16.	"	1,197	17·2	11	1·74	92·29	20	Metering taken at 1st rapids below gauge
Nov. 18	C. O. Allen	1,374	90	265	0·56	93·25	148	

Daily Gauge Height and Discharge of Roseau River near Stuartburn, for 1915.

[Drainage area 1,520 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	....	....	....	....	....	....	....	....	....	....	94·94	684
2	....	....	....	....	....	....	....	....	....	....	94·84	649
3	....	....	....	....	....	....	....	....	....	....	94·64	579
4	....	....	....	....	....	....	....	....	....	....	94·44	512
5	....	....	....	....	....	....	....	....	....	....	94·34	480
6	....	....	....	....	....	....	....	....	....	....	94·18	429
7	....	....	....	....	....	....	....	....	94·76	621	94·14	417
8	....	....	....	....	....	....	....	....	94·66	585	94·19	432
9	....	....	....	....	....	....	....	....	94·72	606	94·24	448
10	....	....	....	....	....	....	....	....	94·72	606	94·37	489
11	....	....	....	....	....	....	....	....	94·71	603	94·49	528
12	....	....	....	....	....	....	....	....	94·79	631	94·64	579
13	....	....	....	....	....	....	....	....	94·92	678	94·76	621
14	....	....	....	....	....	....	....	....	95·04	721	94·79	631
15	....	....	....	....	....	....	....	....	95·12	750	94·82	640
16	....	....	....	....	....	....	....	....	95·18	772	94·98	700
17	....	....	....	....	....	....	....	....	95·22	786	95·07	732
18	....	....	....	....	....	....	....	....	95·27	804	95·17	768
19	....	....	....	....	....	....	....	....	95·29	811	95·16	765
20	....	....	....	....	....	....	....	....	95·36	837	95·22	786
21	....	....	....	....	....	....	....	....	95·38	844	95·27	704
22	....	....	....	....	....	....	....	....	95·42	858	95·34	829
23	....	....	....	....	....	....	....	....	95·46	873	95·38	844
24	....	....	....	....	....	....	....	....	95·48	880	95·39	848
25	....	....	....	....	....	....	....	....	95·49	883	95·44	865
26	....	....	....	....	....	....	....	....	95·50	887	95·61	927
27	....	....	....	....	....	....	....	....	95·46	873	95·58	916
28	....	....	....	....	....	....	....	....	95·44	866	95·54	901
29	....	....	....	....	....	....	....	....	95·44	866	95·47	876
30	....	....	....	....	....	....	....	....	95·24	794	95·44	865
31	....	....	....	....	....	....	....	....	95·12	750	....	

Day.	July.		August.		September.		October.		November.		December	
1	95·47	876	94·26	454	92·49	40	92·48	39	92·59	54	....	
2	95·52	894	94·14	417	92·34	21	92·45	35	92·62	58		
3	95·61	927	94·07	396	92·14	10	92·52	44	92·60	55		
4	95·59	919	93·96	363	91·99	5	92·62	58	92·59	54		
5	95·60	923	93·89	342	91·86	3	92·67	65	92·62	58		
6	95·62	930	93·79	313	92·17	12	92·59	54	92·62	58		
7	95·62	930	93·74	300	92·29	19	92·64	61	92·61	56		
8	95·64	937	93·64	273	92·34	24	92·62	58	92·61	56		
9	95·66	945	93·56	251	92·32	22	92·60	55	92·59	54		
10	95·76	981	93·47	228	92·29	19	92·59	54	92·62	58		
11	95·88	1,024	93·32	190	92·29	19	92·57	51	92·62	58		
12	95·86	1,017	93·04	129	92·30	20	92·57	51	92·64	61		
13	95·85	1,013	92·85	94	92·29	19	92·61	56				
14	95·84	1,009	93·02	125	92·31	21	92·64	61				
15	95·72	966	92·99	119	92·32	22	92·62	58				
16	95·65	941	92·96	114	92·29	19	92·54	47				
17	95·56	909	92·94	110	92·34	24	92·56	49				
18	95·59	919	92·89	101	92·36	25	92·59	54				
19	95·62	930	92·82	89	92·32	22	92·56	49				
20	95·48	880	92·76	79	92·34	24	92·56	49				
21	95·39	847	92·74	75	92·33	23	92·60	55				
22	95·17	768	92·64	61	92·34	24	92·62	58				
23	95·14	757	92·62	58	92·35	25	92·60	55				
24	95·06	729	92·62	58	92·40	29	92·48	39				
25	94·97	696	92·59	54	92·42	31	92·59	54				
26	94·77	621	92·62	58	92·44	34	92·57	51				
27	94·69	595	92·84	92	92·46	36	92·49	40				
28	94·64	579	92·92	107	92·46	36	92·56	49				
29	94·59	561	92·96	114	92·50	41	92·59	51				
30	94·49	528	92·94	110	92·52	44	92·62	58				
31	94·33	477	92·57	51	...		92·54	47				

Note.—Station established May 7, 1915.
Ice conditions from November 13 to end of year.
Not sufficient information to compute daily discharges.

Monthly Discharge of Roseau River at Stuartburn for 1915.

[Drainage area 1,810 square miles.]

MONTH.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet
May	....	....	[1]775	0·428	0·493	47,700
June	927	417	678	0·375	0·418	40,300
July	1,084	477	840	0·464	0·535	51,600
August	454	51	172	0·095	0·110	10,600
September	44	3	24	0·013	0·014	1,430
October	65	35	52	0·029	0·033	3,200
November	....	....	[1]60	0·033	0·037	3,570
December	....	....	[1]30	0·017	0·020	1,850
The Period	1,084	3	329	0·182	1·660	160,250

Note.—Discharges marked thus ([1]) are estimated.

ROSEAU RIVER BELOW DOMINION CITY.

HISTORY.

The section at Baskerville's farm while satisfactory was considerably out of the route and entailed a drive of nearly eighteen miles. On April 14, 1914, the above station was established by D. B. Gow to supersede it.

LOCATION OF SECTION.

The station below Dominion City is about 2,000 feet below the C.P.R. bridge over the Roseau and about 2,100 feet below the C.P.R. dam on the river. The I.P. is a nail in an eight inch white ash tree blazed and near the top of the left bank.

RECORDS AVAILABLE.

A daily gauge height record has been kept since April 14, 1914, and sufficient meterings have been taken to define the discharge curve. Daily discharges have been computed for the station.

DRAINAGE AREA.

The drainage area is 1,940 square miles.

GAUGE.

The gauge is a vertical staff fastened to a two by four inch scantling driven into the stream bed and braced. It is located one thousand feet below the section and is nearer the town on account of the winding of the river.

CHANNEL.

There is only one channel at all stages. The bottom is fairly permanent, the banks are sloping and not subject to overflow. The channel is straight for three hundred and fifty feet above the section and for one hundred feet below.

DISCHARGE MEASUREMENTS.

Measurements are made by means of a cable carrier, the cable being stretched across the stream and the meterings are made by suspending the meter from it. The meterings cover a range in stage of five feet.

ACCURACY.

The discharge curve is well defined between gauge heights 87·00 and 89·00 and fairly well defined between gauge heights 89·00 and 92·70.

Discharge Measurements of Roseau River Below Dominion City, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
Jan. 21.	C. O. Allen .	1,912	43·0	45	0·24	87·46	11	Ice Measurement
21.	"	1,913	43·0	45	0·19	87·46	9	" "
Mar. 20.	"	1,912	33·0	25	0·67	88·43	17	" "
April 15.	T. J. Moore.	1,435	66·5	520	1·86	93·32	967	Boat Measurement.
May 22.	C. O. Allen.	2,018	83·5	512	1·88	90·06	963	Not at regular sec
June 19.	"	2,018	62·0	411	1·89	92·56	778	
July 9.	T. H. Boyd.	1,197	86·0	692	1·77	95·51	1,226	
9	"	1,197	86·0	692	1·73	95·49	1,198	
22.	"	1,197	67·7	465	1·92	93·20	893	
22.	"	1,197	67·7	465	1·91	93·18	888	
Aug. 20.	"	1,197	50·3	119	0·95	87·60	113	
Sept. 14.	"	1,197	42·0	64	0·37	86·47	24	
Nov. 21.	C. O. Allen.	1,374	51·0	137	0·91	88·35	124	Ice Measurement.

DAILY GAUGE AND HEIGHT DISCHARGE OF ROSEAU RIVER BELOW DOMINION CITY FOR 1915.

[Drainage area 1,880 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1									91·96	682	92·72	796
2									92·13	707	92·24	724
3									92·23	723	91·94	679
4									92·25	725	91·42	601
5									92·16	712	91·12	556
6									91·93	677	90·94	529
7									91·92	676	90·47	459
8									91·73	647	90·42	452
9									91·53	618	90·52	466
10									91·55	621	90·54	469
11									91·63	632	90·81	510
12									91·38	595	91·02	541
13									91·73	647	91·31	585
14									92·02	691	91·54	619
15							93·33	888	92·25	726	91·62	631
16							92·93	827	92·54	769	91·81	660
17							92·83	812	92·62	781	92·12	706
18							92·63	782	92·74	799	92·37	743
19							92·05	696	92·82	811	92·55	771
20					88·43	17	92·03	692	92·97	834	92·72	796
21	87·71	10					91·82	661	93·04	844	92·80	808
22							91·72	646	93·14	859	92·89	822
23							91·63	632	93·21	869	93·00	838
24							91·42	601	93·32	886	93·12	856
25							91·23	573	93·34	889	93·19	867
26							91·05	546	93·42	901	93·32	886
27							90·95	530	93·47	909	93·50	914
28							91·07	548	93·51	916	93·55	922
29							91·22	571	93·42	901	93·65	938
30							91·42	601	93·21	869	93·70	946
31									93·01	839		

Day.	July.		August.		September.		October.		November.		December.	
1	93·82	964	90·60	478	86·82	49	86·62	34	86·82	49	88·21	
2	94·00	991	90·52	466	86·57	31	86·53	28	86·89	54	88·16	
3	[1]94·20	1,021	90·30	435	86·47	24	86·63	35	86·91	56	88·13	
4	[1]94·30	1,036	90·10	407	86·46	24	86·64	36	86·51	27	88·11	
5	94·50	1,066	89·92	381	[1]86·46	24	86·83	49	86·66	37	88·09	
6	94·85	1,119	89·72	353	[1]86·47	24	86·89	51	86·80	47	88·06	
7	95·10	1,156	89·55	330	[1]86·46	24	86·94	58	86·89	54	88·06	
8	95·39	1,200	89·30	297	[1]86·45	23	86·96	60	86·93	57	88·03	
9	95·50	1,216	89·22	287	[1]86·40	20	87·04	66	87·01	64	87·91	
10	95·82	1,264	89·10	273	[1]86·38	19	86·99	62	87·03	65	87·99	
11	95·95	1,284	88·90	249	[1]86·40	20	86·93	57	87·06	68	87·99	
12	95·90	1,276	88·79	236	[1]86·38	19	87·04	66	87·40	98	87·96	
13	95·42	1,204	[1]88·60	215	[1]86·43	22	87·03	65	87·21	81	87·95	
14	95·05	1,149	[1]88·40	193	86·46	24	86·95	59	87·50	85	87·95	
15	95·10	1,156	[1]88·40	163	86·45	23	87·01	66	87·50	107	87·94	
16	94·70	1,096	[1]87·80	134	86·41	21	86·94	58	88·01		87·94	
17	94·35	1,044	[1]87·60	116	86·41	21	86·97	61	88·60		87·91	
18	93·95	984	[1]87·40	98	86·45	23	86·91	56	88·51		87·93	
19	93·82	964	[1]87·30	89	86·46	24	86·87	53	88·46		87·81	
20	93·80	961	87·22	82	86·45	23	86·84	50	88·41		87·99	
21	93·79	960	87·16	76	86·41	21	86·74	43	88·31	124	88·01	
22	93·10	853	87·07	69	86·38	19	86·81	48	88·39		88·01	
23	92·89	822	86·99	62	86·45	23	86·67	38	88·29		87·99	
24	92·80	808	86·87	53	86·46	24	86·84	50	88·41		87·96	
25	92·49	762	86·86	52	86·58	32	86·87	53	88·36		87·95	
26	92·10	703	86·77	45	86·61	34	86·91	56	88·34		87·95	
27	91·80	658	86·69	39	86·65	37	86·94	58	88·31		87·95	
28	91·52	616	86·67	38	86·65	37	86·96	60	88·31		87·95	
29	91·30	583	86·66	37	86·61	34	86·91	56	88·26		87·95	
30	91·09	552	86·57	31	86·58	32	86·82	49	88·23		87·96	
31	90·85	516	86·76	44			86·87	53			87·96	

NOTE.—Gauge heights marked thus (1) Interpolated.
Ice Conditions from January 1 to April 14 and from November 16 to December 31
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF ROSEAU RIVER NEAR DOMINION CITY FOR 1915.

[Drainage area 2,150 square miles.]

MONTH.	Discharge in Second-Feet				Run-Off	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]10	0·005	0·006	615
February	....	....	[1]8	0·004	0·004	444
March	....	....	[1]15	0·007	0·008	922
April	....	....	[1]360	0·167	0·187	21,400
May	916	595	766	0·356	0·410	47,100
June	946	452	703	0·327	0·365	41,800
July	1,284	516	967	0·450	0·519	59,500
August	478	31	188	0·087	0·100	11,600
September	49	19	26	0·012	0·013	1,550
October	66	28	53	0·025	0·029	3,250
November	....	....	[1]90	0·042	0·047	5,350
December	....	....	[1]45	0·021	0·024	2,775
The Year	1,284	....	269	0·125	1·712	196,306

NOTE.—Discharges marked thus (1) are estimated.

THE RAT RIVER.

The drainage area of the Rat river from its source to its mouth comprises 997 square miles. The northern boundary of this area is formed by the watersheds of the Whitemouth and Seine rivers, while its southern limits consist of the northern slope of the watershed of the Roseau river.

The west branch of the river takes its rise in the country lying to the southeast of the town of Woodridge on the Ontario Branch of the Canadian Northern Railway, and is confined chiefly to Tp. 3, R. 11, E.P.M. The first ten miles of its course the river has a southwesterly bearing, from this latter point it flows northwest for about four miles, then nearly due south for three miles, then north for about six miles. This latter point lies about two miles east of the town of Zhoda, from this point it flows through a swampy and marshy country due west for about eighteen miles and then in a northwesterly direction to its mouth at the Red river.

The territory drained is generally flat prairie country, except in the upper reaches, where the land is inclined to be wet and swampy. Nearly all the drainage area is under cultivation, the settlement being about the oldest in the province.

RAT RIVER AT OTTERBURNE.

HISTORY.

The station was established by S. S. Scovil on May 23, 1912.

LOCATION OF SECTION.

The section is on the downstream side of the bridge which crosses the Rat at F. X. Joubert's farm, four miles from Otterburne by the C.P.R. and two miles from St. Pierre. The I.P. is marked by a spike driven in the south end of the downstream railing

RECORDS AVAILABLE.

A daily gauge height record has been kept for the open water periods from May 23, 1913, to date. During the winter periods an intermittent record has been kept and is available. Estimates of daily discharge have been prepared based upon the rating curve constructed from the meter records.

DRAINAGE AREA.

The area drained is 650 square miles. The basin lies between the Roseau on the south and the Seine and Whitemouth on the north and east.

GAUGE.

The gauge is a nine-foot vertical staff gauge secured to a pile sixteen feet from the left bank at the section. This gauge is referred to a permanent M.H.S. B.M. located about 30 feet southwest from the gauge. The B.M. is set to an assumed datum.

CHANNEL.

Above the station the channel is straight for two hundred feet and for one hundred feet below. There is one channel at all stages. The bottom is of clay and liable to shift.

DISCHARGE MEASUREMENTS.

Discharge measurements are made from the downstream side of the bridge. A range in stage of 8.4 feet has been defined on the rating curve. Under winter conditions it has not been possible to obtain a rating.

DIVERSIONS.

The C.P.R. has constructed a dam four miles below the metering station and use the pond created as a source of supply. Under low water conditions it is reported the company utilize the whole flow of the river.

ACCURACY.

From gauge height 88.30 to 92.40 the discharge curve is well defined, from 92.40 to 96.70 it is fairly well defined. It is not possible to define a discharge curve for winter conditions.

Discharge Measurements of Rat River at Otterburne, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft	Ft. per sec	Feet	Sec. ft
Jan. 4	M. S. Madden	1,462	21·0	3·3	0·00	88·37	0·0
April 16	T. J. Moore.	1,435	51·2	151·6	1·11	91·49	168·3
May 22	C. O. Allen	2,018	43·0	103·2	0·94	90·18	97·0
June 20	"	2,018	38·3	81·5	0·88	89·68	71·7
July 10	T. H. Boyd	1,197	35·7	57·7	0·66	89·10	38·1
July 23	"	1,197	35·7	67·5	0·71	89·22	48·0
Aug. 21	"	1,197	29·7	29·8	0·00	88·19	0·0
Nov. 17	C. O. Allen	1,374	37·0	57·1	0·62	89·57	35·6[1]

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[1] Ice cover.

[2] No discharge

Daily Gauge Height and Discharge of Rat River at Otterburne for 1915.

[Drainage area 650 square miles.]

Day	January.		February.		March.		April.		May		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet	Sec. ft.	Feet.	Sec. ft
1		...	...	....	...	....	.....	...	91·48	172	89·08	37
2									91·52	174	89·00	33
3									91·56	177	88·94	30
4	88·37	0					90·56		91·61	181	88·89	28
5							90·59		91·65	184	88·85	26
6							90·79		91·60	180	88·85	26
7							90·79		91·20	154	88·88	27
8							90·81		91·10	148	88·91	28
9							90·86		91·10	148	89·01	33
10							91·36		91·03	144	89·09	38
11							[1]91·36		91·00	142	89·17	42
12							[1]91·36		91·03	144	89·28	47
13							[1]91·38		91·04	144	89.46	56
14							[1]91·43		91·07	146	89·67	67
15							[1]91·47		91·05	145	89·80	73
16							91·49	172	91·00	142	89·81	74
17							91·42	167	90·76	128	89·78	72
18							91·09	147	90·74	127	89·73	70
19							90·80	130	90·50	112	89·63	64
20							90·38	105	90·45	109	89·68	67
21							90·35	103	90·26	98	89·65	66
22							90·30	100	90·21	95	89·62	64
23							90·22	95	90·09	88	89·50	58
24							90·29	99	89·98	82	89·49	57
25							90·73	126	89·90	78	89·46	56
26							90·98	137	89·82	74	89·42	54
27							91·10	148	89·70	68	89·39	53
28							91·30	160	89·69	68	89·42	54
29							91·40	166	89·50	58	89·45	55
30							91·42	167	89·40	53	89·47	56
31									89·28	47	.....	....

Day	July.		August.		September.		October.		November.		December.	
1	89·48	57	88·74	20	88·08	1	88·82	24	89·01	33	89·23	
2	89·43	55	88·72	19	88·07	1	88·82	24	89·04	35	89·22	
3	89·38	52	88·68	17	88·05		88·81	23	89·03	34	89·14	
4	89·33	49	88·64	15	88·02		88·77	22	89·00	33	89·12	
5	89·30	48	88·60	13	88·01		88.80	23	88.96	31	89·12	
6	89·25	45	88·55	11	88·00		88.87	27	88·92	29	89·12	
7	89·20	13	88·47	8	88·00		88·88	27	88·89	28	89·11	
8	89·10	38	88·44	7	88·01		88·87	27	88·96	31	89·11	
9	89·10	38	88·42	7	88·01		88·85	25	89·02	34	89·16	
10	89·10	38	88·37	5	88·02		88·82	24	89·02	34	89·27	
11	89·10	38	88·32	4	88·02		88·79	23	89·05	35	89·27	
12	89·10	38	88·30	4	88·02		88·78	22	88·95	30	89·24	
13	89·10	38	88·30	1	88·09	1	88·82	24	89·04	....	89·27	
14	89·09	38	88·10	1	88·21	2	88·85	25	89·15	...	89·26	
15	89·09	38	87·80		88·32	4	88·84	25	89·27		89·25	
16	89·07	37	87·70		88·33	5	88·82	24	89·55	.	89·24	
17	89·06	36	87·60		88·34	5	88·80	23	89·58	36	89·27	
18	89·04	35	[1]87·70		88·35	5	88·80	23	89·47	..	89·25	
19	89·03	34	[1]87·80		88·34	5	88.79	23	89·38	..	89·23	
20	89·03	34	88·00		88·37	5	88·78	22	89·35		89·22	
21	89·05	35	88·11	1	88·38	6	88·77	21	89·33		89·21	
22	89·05	35	88·09	1	88·39	6	88·76	21	89·31		89·19	
23	89·06	36	88·08	1	88·40	6	88·76	21	89·17		89·20	
24	89·08	37	88·08	1	88·37	6	88·75	20	89·17		89·20	
25	89·19	13	88·09	1	88·43	7	88·82	24	89·27		89·23	
26	89·16	41	88·09	1	88·47	8	88·87	27	89·28		89·24	
27	89·10	38	88·10	1	88·51	11	88·92	29	89·29		89·25	
28	89·05	35	88·11	1	88·55	11	88·95	30	89·29		89·25	
29	88·98	32	88·11	1	88·56	11	88·97	32	89·28		89·12	
30	88·22	21	88·12	1	88·62	14	88·97	32	89·17		89·10	
31	88·76	21	88·10	1		..	88·97	32	.		89·11	

NOTE.—Gauge heights marked thus ([1]) interpolated.
Ice conditions from January 1 to April 15 and November 13 to December 31.
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF RAT RIVER AT OTTERBURNE FOR THE YEAR 1915.

[Drainage area, 650 square miles]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet.
January			[1]0	....	....	
February			[1]0	....	....	...
March			[1]2	0·003	0·003	123
April	.....	....	[1]95	0·146	0·163	5,650
May	184	47	123	0·189	0·218	7,550
June	74	26	50	0·077	0·086	2,975
July	57	21	39	0·060	0·069	2,400
August	20	0	5	0·008	0·009	307
September	14	0	4	0·006	0·007	238
October	32	20	25	0·038	0·044	1,540
November	....	....	[1]25	0·038	0·042	1,500
December	.....	....	[1]5	0·008	0·009	307
The Period	184	0	31	0·048	0·650	22,590

NOTE.—All marked thus (1) estimated.

SEINE RIVER AT STE. ANNE DE CHENES.

HISTORY.

On October 4, 1912, a metering station was established on the Seine river near Ste. Anne des Chenes, but observations were discontinued on November 11 of the same year, and no further information was obtained at this point until May 1, 1915, when operations were again commenced in an endeavour to obtain a rating of the river.

LOCATION OF SECTION.

The Seine is a tributary of the Red river and joins same in the City of St. Boniface. The metering station is located about one mile east of the town of Ste. Anne des Chenes on the downstream side of the C.N. Ry. bridge at this point. The Initial Point is a bolt on the west end of the bridge.

RECORDS AVAILABLE.

Records of gauge readings are available from October 4 to November 11 for the year 1912, and from May 1 to November 12 for 1915. Estimated daily discharges are also available during the latter period based on discharge measurements covering a range of 3·3 feet.

DRAINAGE AREA.

The drainage area tributary to the river at this point is 310 square miles.

GAUGE.

A six-foot vertical staff gauge is secured to the fourth pile from the west end on the downstream side of the C.N. Ry. bridge This gauge is referred to a B.M. located on the first telegraph pole west of the bridge

CHANNEL.

The section is located at a slightly curved part of the river. The bed of the stream is sandy, and at all stages the flow of the river will be confined to the one channel covered by the section.

DISCHARGE MEASUREMENTS.

The discharge measurements at all stages of the river are taken from the bridge.

ACCUARCY.

The discharge curve is fairly well defined over the range in stage covered by the recorded gauge heights.

DISCHARGE MEASUREMENT OF SEINE RIVER AT STE. ANNE DES CHENES, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
May 1..	Alex. Pirie........	1,939	71	288·8	1·52	95·93	440·7
May 19..	G. K. Gainsford..	1,187	61	161·7	1·09	94·02	176·5
June 8..	C. O. Allen.....	2,018	56	131·2	0·43	93·24	56·4
June 28.	E. B. Patterson.	1,920	62	152·6	0·72	93·83	109·9
Aug. 6..	T. H. Boyd.......	1,197	44	77·5	0·00	92·67	0·00

DAILY GAUGE HEIGHT AND DISCHARGE OF SEINE RIVER AT STE. ANNE DES CHENES FOR 1915.

[Drainage area 310 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	.....	.....		....				....	95·93	440	93·14	42
2									95·52	382	93·13	40
3									95·29	348	93·04	28
4									94·93	297	93·04	28
5									94·76	272	92·94	15
6									94·58	247	93·04	28
7									94·50	236	93·02	25
8									94·59	249	93·23	54
9									94·77	274	93·24	56
10									94·85	285	93·51	94
11									94·75	271	93·53	97
12									94·65	257	93·61	108
13									94·61	251	93·63	111
14									94·50	236	93·67	117
15									94·35	214	93·68	118
16									94·25	199	93·69	120
17									94·10	178	93·74	127
18									93·95	157	93·79	134
19									94·04	170	93·83	139
20									93·94	155	93·77	131
21									93·84	141	93·73	125
22									93·74	127	93·69	120
23									93·69	120	93·67	117
24									93·61	108	93·59	106
25									93·54	99	93·57	103
26									93·50	93	93·53	97
27									93·42	81	93·67	117
28									93·39	77	93·81	136
29									93·34	70	93·88	146
30									93·24	56	93·69	120
31									93·22	53	......	

	July.		August.		September.		October.		November.		December	
1	93·63	111	92·84	7	92·38	0	92·99	21	93·39	77		
2	93·59	106	92·79	5	92·38	0	92·99	21	93·39	77		
3	93·58	104	92·74	2	92·38	0	92·99	21	93·41	80		
4	93·53	97	92·69	0	92·39	0	92·99	21	93·37	74		
5	93·51	94	92·69	0	92·38	0	92·97	18	93·35	71		
6	93·49	92	92·67	0	92·37	0	92·99	21	93·33	68		
7	93·44	84	92·64	0	92·34	0	92·99	21	93·29	63		
8	93·34	70	92·59	0	92·38	0	92·99	21	93·34	70		
9	93·27	60	92·58	0	92·34	0	93·09	35	93·39	70		
10	93·28	61	92·55	0	92·37	0	93·24	56	93·41	80		
11	93·20	50	92·54	0	92·38	0	93·30	64	93·42	81		
12	93·19	49	92·58	0	92·37	0	93·34	70	93·44	84		
13	93·47	89	92·57	0	92·41	0	93·39	77				
14	93·48	90	92·49	0	92·47	0	93·40	78				
15	93·39	77	92·47	0	92·49	0	93·39	77				
16	93·29	63	92·45	0	92·50	0	93·38	75				
17	93·19	49	92·44	0	92·48	0	93·39	77				
18	93·19	49	92·49	0	92·57	0	93·39	77				
19	93·19	49	92·51	0	92·59	0	93·39	77				
20	93·17	46	92·49	0	92·58	0	93·39	77				
21	93·29	63	92·50	0	92·56	0	93·89	148				
22	93·39	77	92·49	0	92·55	0	93·86	143				
23	93·29	63	92·48	0	92·59	0	93·89	148				
24	93·19	49	92·47	0	92·61	0	93·39	77				
25	93·18	47	92·45	0	92·89	9	93·40	78				
26	93·14	42	92·41	0	92·69	0	93·29	63				
27	93·09	35	92·40	0	92·64	0	93·34	70				
28	92·99	21	92·39	0	92·89	9	93·27	60				
29	92·89	10	92·41	0	92·99	21	93·34	70				
30	92·86	8	92·39	0	92·99	21	93·39	77				
31	92·79	5	92·39	0			93·40	78				

NOTE.—Ice conditions November 13 to December 31.
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF SEINE RIVER AT STE. ANNE DES CHENES FOR 1915.

[Drainage area 310 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
May	140	53	198	0·639	0·737	12,200
June	146	15	93	0·300	0·335	5,530
July	111	5	62	0·200	0·231	3,800
August	7	0	0	0·000	0·000	0
September	21	0	2	0·006	0·007	119
October	148	18	65	0·210	0·242	4,000
November	....	....	[1]40	0·129	0·144	2,380
December	....	....	[1]10	0·032	0·037	615
The Period	....	....	59	0·189	1·733	28,644

NOTE.—Marked thus (1) estimated.

ASSINIBOINE RIVER AND TRIBUTARIES.

ASSINIBOINE RIVER.

The Assiniboine river is one of the chief tributaries of the Red river, joining the latter within the city limits of Winnipeg, rising in the province of Saskatchewan on the southeastern slope of the Nut mountains. It flows in a southeasterly direction and crosses the Manitoba boundary in Tp. 26, R. 28, W.P.M., and thence nearly due south until it reaches Tp. 10, R. 25, W.P.M., where it turns and flows south and east to the Red river.

The principal tributaries of the Assiniboine are the Shell, Qu'Appelle, Little Saskatchewan and Souris rivers. The total drainage area is 59,550 square miles, of which 8,800 square miles are in the State of North Dakota, 37,700 square miles in the province of Saskatchewan and 13,050 square miles in the province of Manitoba.

The area drained varies between the open prairie to be found in the southwestern part of the province and the well timbered country lying on the slopes of the Duck and Riding mountains. In the prairie country the banks are sharp cut, rising abruptly from the water's edge for a height varying from three to twenty-five feet. In the wooded section or the upper part of the drainage area the valley is well defined and narrow, the rise from the river in some places reaching an elevation of two hundred and fifty feet above the water level.

In the lower part of the river basin the land is nearly all under cultivation, the soil is rich but in the valley bottom it is subject to overflow. It flows through the most densely populated part of the Province, the three largest cities, Portage La Prairie, Brandon and Winnipeg being built upon its banks.

The importance of this river as a source of water supply, a means of drainage and sewage disposal is great in a district where the natural water supply is somewhat limited. In order that a study may properly be made of its regimen and data for various purposes be gathered several gauging stations have been established. All have not been in continuous operation but discharge records have been obtained at the following places on the river:—

1. Millwood.
2. Brandon.
3. Headingly.
4. St. James.

TRIBUTARIES.

The tributaries of the Assiniboine river in order from source to mouth are:—

1. Shell river.
2. Qu'Appelle river.
3. Birdtail Creek.

4. Little Saskatchewan river.
5. Souris river.
6. Cypress river.

On all of these, with the exception of the Qu'Appelle river, records of discharge are available.

ASSINIBOINE RIVER AT MILLWOOD.

HISTORY.

The station on the Assiniboine river at Millwood was established by W. G. Worden on October 11, 1912, and has been in operation since that time.

LOCATION OF SECTION.

The meter section is located on the downstream side of the traffic bridge, four hundred feet below the dam, one-quarter of a mile south from the town and one-half mile below the C.P.R. bridge. The I.P. is an arrow cut and painted on the top of the wooden hand rail of the bridge at the northeast corner on the downstream side. It is marked "0+00 I.P."

RECORDS AVAILABLE.

Daily gauge height records are available for the station from October 11, 1912, to the end of 1915, except for the period February 9 to March 28, 1914. Estimates of daily discharge are available from January 27, 1913, to the end of 1915, except for the above period.

DRAINAGE AREA.

The area tributary to the Assiniboine river above the station is 7,590 square miles.

GAUGE.

A 12-foot vertical staff gauge is secured to the centre pier of the bridge on the downstream side; it is referred to a permanent M.H.S. B.M. located 75 feet southeast from the downstream side of the bridge on the left bank. This B.M. is set to an assumed datum.

Taken by T. H. Boyd.

Assiniboine River—Millwood—Bridge from Below, Showing Gauge.

CHANNEL.

For four hundred feet above the section and two hundred feet below the channel is straight. The river at all stages occupies one channel, which is divided just above the section by a central pier of the bridge. The bed of the stream is clay, sand and gravel and not subject to shifting. The banks are low and liable to overflow at high stages.

DISCHARGE MEASUREMENTS.

The discharge measurements are taken from the downstream side of the bridge and cover a range in stage under open water conditions of 8·3 feet.

ACCURACY.

Under open water conditions the discharge curve is well defined between the limits 98·91 and 107·4, beyond which it is not well defined. The discharge curve for ice conditions is fairly well defined between gauge heights 97·5 and 99·5.

DISCHARGE MEASUREMENTS OF ASSINIBOINE RIVER AT MILLWOOD, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec. ft.
Jan. 21...	M. S. Madden.....	1,462	141	153	0·31	99·90	51[1]
Mar. 17...	"	1,462	131	183	0·34	99·83	63[1]
April 18...	C. O. Allen........	1,912	145	647	1·51	101·12	972
27...	"	1,912	145	488	0·87	99·96	423
May 12...	"	2,018	142	409	0·63	99·37	258
June 3...	"	2,018	143	373	0·54	99·19	201
July 28...	T. H. Boyd........	1,197	141	423	0·95	99·79	402
Sept. 3...	"	1,197	145	286	0·35	99·06	100
Oct. 26...	C. O. Allen........	1,374	143	358	0·48	99·02	172

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[1] Ice Measurement

DAILY GAUGE HEIGHT AND DISCHARGE OF ASSINOBOINE RIVER AT MILLWOOD FOR 1915.

[Drainage area 7,590 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	99·56	....	99·98	....	99·73	....	99·58	....	99·72	373	99·21	193
2	99·43	....	100·08	....	99·78	....	99·53	....	99·66	349	99·19	187
3	99·73	....	100·09	....	99·91	....	99·58	....	99·61	329	99·15	175
4	99·98	....	100·03	....	99·91	....	99·60	....	99·56	311	99·11	163
5	99·78	....	99·98	....	99·96	....	99·63	....	99·52	297	99·11	163
6	99·65	....	99·98	....	100·35	....	99·71	369	99·50	290	99·21	193
7	99·68	....	99·78	....	99·83	....	99·74	381	99·46	276	99·22	196
8	99·61	....	99·73	....	99·71	....	99·83	417	99·43	265	99·27	211
9	99·80	....	99·68	....	99·75	....	99·88	436	99·40	255	99·31	224
10	99.80	....	100·03	....	99·78	....	100·15	558	99·36	241	99·36	241
11	99·73	....	99·83	....	99·88	....	100·18	571	99·37	245	99·44	269
12	99·68	....	99·64	....	99·88	....	100·33	638	99·37	245	99·41	258
13	99·79	....	100·25	....	99·85	....	100·44	690	99·36	241	99·41	258
14	99·63	....	99·78	....	99·88	....	100·79	865	99·35	237	99·51	293
15	99·68	....	99·78	....	99·78	....	100·82	880	99·33	230	99·49	286
16	100·16	....	99·80	....	99·83	....	101·21	1,075	99·31	224	99·46	276
17	99·83	....	99·78	....	99·83	....	101·44	1,202	99·31	224	99·51	293
18	99·88	....	99·71	....	99·88	....	101·14	1,040	99·31	224	99·46	276
19	99·93	....	99·70	....	99·78	....	100·81	875	99·31	224	99·41	258
20	99·93	....	99·76	....	99·88	....	100·69	815	99·31	224	99.48	283
21	99·87	....	99·66	....	99·83	....	100·52	730	99·31	224	99·61	329
22	99·84	....	100·48	....	99·83	....	100·41	675	99·31	224	99·55	307
23	99·68	....	99·78	....	99·73	....	100·27	612	99·31	224	99·55	307
24	99·53	....	99·73	....	99·58	....	100·12	544	99·30	220	99·57	315
25	100·08	....	99·83	....	99·68	....	100·06	517	99·29	217	99·55	307
26	100·18	....	99·78	....	99·79	....	100·00	490	99·29	217	99·53	300
27	100·68	....	99·78	....	99·69	....	99·91	450	99·27	211	99·51	294
28	100·38	....	99·86	....	99·69	....	99·86	429	99·26	208	99·51	294
29	100·18	....	....	....	99·68	....	99·84	421	99·26	208	99·48	283
30	100·08	....	....	....	99·58	....	99·78	397	99·25	205	99·46	276
31	99·88	....	....	....	99·58	....	....	....	99·23	199	....	....

	July.		August.		September.		October.		November.		December.	
1	99·45	273	99·55	308	98·87	98	99·04	142	99·00	130		
2	99·45	273	99·51	293	98·89	102	99·05	145	99·00	130		
3	99·43	265	99·46	276	98·91	107	99·11	163	99·01	133		
4	99·41	258	99·41	258	98·93	113	99·10	160	99·01	133		
5	99·51	293	99·36	241	98·90	105	99·10	160	99·01	133		
6	99·52	297	99·31	224	98·91	108	99·09	157	99·02	136		
7	99·54	304	99·26	208	98·91	108	99·08	154	99·02	136		
8	99·53	300	99·21	193	98·92	101	99·06	148	99·00	130		
9	99·53	300	99·16	178	99·93	112	99·05	145	98·88	100		
10	99·51	293	99·12	166	99·00	130	99·01	142	98·75	70		
11	99·51	293	99·08	154	98·99	127	99·03	139	98·86	95		
12	99·46	276	99·06	148	98·95	117	99·03	139	99·00	130		
13	99·43	265	99·04	142	98·93	112	99·02	136	99·02	136		
14	99·41	259	99·03	139	98·92	110	99·02	136	99·02	136		
15	99·53	300	99·01	133	98·93	112	99·02	136	99·00	130		
16	99·59	321	98·98	125	98·94	115	99·01	133	98·98	125		
17	99·74	381	98·96	120	98·96	120	99·01	133	98·98	125		
18	99·81	409	98·94	115	98·98	125	99·01	133	99·00	130		
19	99·85	425	98.91	107	99·00	130	99·01	133	99·03	139		
20	99·92	454	98·89	103	99·01	133	99·00	130	99·05	145		
21	100·16	562	98·88	100	99·02	136	99·00	130	99·06	148		
22	100·30	625	98·87	98	99·01	133	98·99	127	99·07	151		
23	100·21	584	98·86	95	99·01	133	99·00	130	99·07	151		
24	100·16	562	98·85	92	99·00	130	99·00	130	99·08	154		
25	100·07	521	98·84	90	98·98	125	99·01	133	99·09	157		
26	99·96	472	98·83	88	98·96	120	99·02	136	99·10	160		
27	99·94	449	98·82	85	98·95	118	99·02	136	99·10	160		
28	99·79	401	98·82	85	98·95	118	99·01	133	99·11	163		
29	99·71	369	98·83	88	98·96	120	99·01	133	99·11			
30	99·67	353	98·84	90	98·99	128	99·01	133	99·12			
31	99·59	321	98·85	92	.....	.....	99·01	133				

NOTE.—Ice Conditions from January 1 to April 5 and November 29 to end of year
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF ASSINIBOINE RIVER AT MILLWOOD FOR THE YEAR 1915.

[Drainage area 7,590 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches of Drainage Area.	Total in acre-feet.
January	....	51	[1]45	0·006	0·007	2,775
February	....	....	[1]63	0·008	0·008	3,500
March	....	....	[1]65	0·009	0·010	4,000
April	1,202	....	[1]590	0·078	0·087	35,100
May	373	199	247	0·032	0·037	15,200
June	329	163	257	0·034	0·038	15,300
July	625	258	370	0·049	0·056	22,800
August	308	88	149	0·020	0·023	9,200
September	136	98	119	0·016	0·018	7,100
October	163	130	140	0·018	0·021	8,600
November	163	....	[1]130	0·017	0·019	7,700
December	....	....	[1]75	0·010	0·011	4,600
The Year	1,202	51	188	0·025	0·335	135,875

NOTE.—Marked thus (1) estimated.

ASSINIBOINE RIVER AT BRANDON.

HISTORY.

The station on the Assiniboine at Brandon was established on July 4, 1912, by G. H. Burnham and has been operated since that date.

LOCATION OF SECTION.

The meter section is located on the downstream side of First Street traffic bridge, locally known as the Iron Bridge, in the city of Brandon, Manitoba. The I.P. is marked on the iron railing on the downstream side of the bridge at the south end.

RECORDS AVAILABLE.

Nearly continuous records of daily gauge heights are available from July 4, 1912, to the end of 1915. Estimates of daily discharge have been made for the same period.

DRAINAGE AREA.

The drainage area of the Assiniboine river above Brandon is 31,500 square miles.

GAUGE.

A nine-foot vertical staff gauge is nailed to the ice breaker fifty feet upstream from and opposite station 1+60 on the metering section.

CHANNEL.

For three hundred feet upstream and one hundred and fifty feet downstream the channel is straight. It is divided at the section into three parts by the bridge piers. The bottom is of mud and liable to shift, especially at high stages. The banks are high but liable to overflow at high stages.

DISCHARGE MEASUREMENTS.

The meterings are made from the downstream side of the bridge. They cover a range in stage under open water conditions of 12·5 feet.

ACCURACY.

Between gauge heights 97·5 and 104·1 the discharge curve is well defined, between 104·1 and 110·0 it is fairly well defined, above and below these limits it is not well defined for open water conditions. Between gauge heights 96·5 and 98·0 the discharge curve for winter conditions is fairly well defined.

Discharge Measurements of Assiniboine River at Brandon, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 4	C. O. Allen	1,912	183	201	0·35	98·07	71[1]
26	M. S. Madden	1,462	169	186	0·30	98·35	57[1]
Mar. 22	"	1,462	129	110	0·98	98·33	108[2]
April 14	C. O. Allen	1,912	172	426	2·24	98·87	956
21	"	1,912	197	582	2·46	99·65	1,432
23	"	1,912	197	582	2·50	99·69	1,451
23	"	1,912	197	582	2·50	99·68	1,454
May 7	"	2,018	172	381	1·83	98·51	698
26	"	2,018	170	361	1·60	98·33	587
29	"	2,018	170	342	1·59	98·25	544
Aug. 2	T. H. Boyd	1,197	162	349	1·97	98·47	629
Sept. 2	"	1,197	141	162	0·97	97·32	157
Oct. 3	C. O. Allen	1,374	151	242	1·06	97·65	257

[1] Ice measurement.

[2] Section partly open.

DAILY GAUGE HEIGHT AND DISCHARGE OF ASSINIBOINE RIVER AT BRANDON FOR 1915.

[Drainage area 34,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height,	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	98·14	....	98·35	....	98·43	....	98·36	....	98·49	672	98·19	497
2	98·12	....	98·35	....	98·43	....	98·32	....	98·48	666	98·19	497
3	98·07	....	98·38	....	98·43	....	98·33	....	98·49	672	97·93	374
4	98·07	71	98·39	....	98·44	....	98·30	....	98·51	684	97·91	365
5	98·07	....	98·41	....	98·43	....	98·30	....	98·51	684	97·95	383
6	98·07	....	98·43	....	98·43	....	98·27	....	98.45	647	97·92	370
7	98.07	....	98.43	....	98·43	....	98.03	....	98.47	659	98·00	405
8	98·03	....	98·43	....	98.40	....	97.98	....	98.39	610	98·05	428
9	98.01	....	98.39	....	98.39	....	97.90	....	98.41	622	98.05	428
10	98.01	....	98.40	....	98.39	....	98.01	....	98·40	616	98·05	428
11	97·99	....	98·40	....	98·38	....	98·26	....	98·29	551	97·92	370
12	97·99	....	98·41	....	98·40	....	98·38	604	98·25	530	97·89	357
13	97·99	....	98·43	....	98·40	....	98·38	604	98·25	530	97·90	361
14	98·03	....	98·45	....	98·40	....	98·95	968	98·26	535	[1]97·96	387
15	98·06	....	98·45	....	98·40	....	98·99	994	98·28	546	[1]98·02	414
16	98·08	....	98·46	....	98·39	....	100·68	2,134	98·34	581	[1]98·07	438
17	98·13	....	98·44	....	98·39	....	100·91	2,296	98·24	524	[1]98·12	462
18	98·13	....	98·43	....	98·39	....	101·14	2,464	98·31	563	[1]98·18	492
19	98·13	....	98·43	....	98·39	....	100·87	2,268	98·34	581	[1]98·22	513
20	98·15	....	98·43	....	98·39	....	100·97	2,339	98·33	575	98·24	524
21	98·17	....	98·43	....	98·37	....	99·62	1,408	98·33	575	98·20	502
22	98·23	....	98·41	....	98·35	108	99·67	1,442	98·34	581	98·00	405
23	98·27	....	98·41	....	98·34	....	99·24	1,157	98·34	581	98·03	419
24	98·27	....	98·40	....	98·34	....	98·98	987	98·29	551	98·20	502
25	98·27	....	98·40	....	98·35	....	98·93	954	98·24	524	98·20	502
26	98·33	57	98·40	....	98·36	....	98·90	935	98·24	524	98·32	569
27	98·34	....	98·40	....	98·36	....	98·83	889	98·24	524	98·44	641
28	98·34	....	98·41	....	98·46	....	98·67	786	98·24	524	98·24	524
29	98·33	....	....	....	98·48	....	98·63	760	98·22	513	98·52	691
30	98·33	....	....	....	98·46	....	98·57	722	98·22	513	98·32	569
31	98·33	....	....	....	98·40	....	....	....	98·20	502	....	....

	July.		August.		September.		October.		November.		December.	
1	98·30	557	98·57	722	97.37	184	97.74	298	....	....	....	....
2	98·27	541	98·39	610	97·32	171	97·83	332	....	....	....	....
3	98·27	541	98·37	598	97·59	247	97·80	320	....	....	....	
4	98·29	551	98·31	563	97·39	189	97·67	273	....	....	....	
5	98·11	457	98·37	598	97·34	176	97·65	267	....	....	....	
6	98·33	575	98·16	482	97·42	198	97·76	305	....	....	....	
7	98·12	462	98·04	424	97·53	229	97·65	267	....	....	....	
8	98·08	443	98·19	497	97·48	214	97·66	270	....	....	....	
9	98·10	452	97·98	396	97·68	276	97·66	270	....	....	....	
10	98·10	452	97·88	353	97·70	283	97·39	189	....	....	....	
11	98·28	546	97·88	353	97·49	217	97·38	187	....	....	....	
12	98·00	405	97·86	345	97·70	283	97·38	187	....	....	....	
13	98·10	452	97·81	324	97·56	238	97·37	184	....	....	....	
14	98·10	452	97·72	290	97·68	276	97·37	184	....	....	98·02	
15	97·98	396	97·79	316	97·72	290	97·37	184	....	....	98·07	
16	98·06	433	97·69	280	97·77	309	97·36	182	....	....	98·08	
17	97·94	379	97·67	273	97·56	238	....	....	....	....	98·15	
18	98·20	502	97·67	273	97·78	313	....	....	....	....	98·15	
19	98·09	447	97·67	273	97·76	305	....	....	....	....	98·16	
20	98·01	410	97·69	280	97·68	276	....	....	....	....	98·16	
21	97·98	396	97·73	294	97·70	283	....	....	....	....	98·09	
22	98·10	452	97·79	316	97·64	263	....	....	....	....	98·10	
23	98·42	628	97·69	280	97·59	247	....	....	....	....	98·07	
24	98·78	857	97·69	280	97·56	238	....	....	....	....	98·08	
25	98·62	754	97·67	273	97·56	238	....	....	....	....	98·11	
26	98·51	684	97·64	263	97·57	241	....	....	....	....	98·13	
27	98·61	747	97·60	250	97·56	238	....	....	....	....	98·17	
28	98·93	954	97·48	214	97·58	244	....	....	....	....	98·17	
29	98·70	805	97·53	229	97·56	238	....	....	....	....	98·18	
30	98·81	876	97·48	214	97·58	244	....	....	....	....	98·19	
31	98·79	864	97·38	187	....	....	....	....	....	....	98·29	

Gauge heights marked thus (1) interpolated.

NOTE.—No gauge records from January 1 to April 11, and October 17 to December 14.
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF ASSINIBOINE RIVER AT BRANDON FOR THE YEAR 1915.
[Drainage area 34,500 square miles.]

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]65	0·002	0·002	4,000
February	....	57	[1]60	0·002	0·002	3,325
March	....	....	[1]90	0·003	0·003	5,550
April	2,464	....	[1]900	0·026	0·029	53,600
May	684	502	580	0·017	0·020	35,600
June	691	357	462	0·013	0·015	27,500
July	876	379	582	0·017	0·020	35,800
August	722	187	358	0·010	0·012	22,000
September	313	171	245	0·007	0·008	14,600
October	....	....	[1]180	0·005	0·006	11,100
November	....	....	[1]170	0·005	0·006	10,100
December	....	....	[1]100	0·003	0·003	6,150
The Period	2,464	57	316	0·009	0·126	229,325

NOTE.—Marked thus (1) estimated.

ASSINIBOINE RIVER AT HEADINGLY.

HISTORY.

The metering station was established on April 9, 1913, by S. S. Scovil and has been operated since that date.

LOCATION OF SECTION.

The meter section is located on the downstream side of the C.N.R. bridge, which crosses the Assiniboine river one-quarter mile from the C.N.R. Headingly station.

The I.P. is marked on the flooring at the north end of the bridge on the downstream side and is painted white, "Init. Pt. 0+00."

RECORDS AVAILABLE.

Gauge height records are available from April 17 to November 23, 1913, and for the years 1914 and 1915. Estimates of daily discharge have been prepared from April 17 to November 23, 1913, June 1 to March 1, 1914, and from April 22, 1914, to the end of 1915, except for part of November, 1914.

DRAINAGE AREA.

The area drained by the Assiniboine river above Headingly is 59,420 square miles.

GAUGE.

A nine-foot vertical staff gauge is fastened to the north abutment of the bridge and is read in summer. A winter gauge, three-foot staff, is fastened to the ice breaker for winter readings. Both are referred to the same arbitrary datum.

CHANNEL.

The channel is straight above and below the section for a considerable distance. The stream is divided into four channels by the three central piers of the bridge. The bottom of the stream is of gravel and mud and not liable to shift. The right bank is low and wooded and liable to overflow at higher stages. The left bank is high and not liable to overflow.

DISCHARGE MEASUREMENTS.

The meterings have been made from the downstream side of the bridge in the open water season and in the winter they have been made from the ice at a point about four hundred feet upstream from the bridge.

ACCURACY.

Between gauge heights 75·5 and 80·9 the discharge curve is well defined. Under ice conditions between gauge heights 73·8 and 76·1 the discharge curve is fairly well defined.

Discharge Measurements of Assiniboine River at Headingly, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 9..	C. O. Allen...	1,912	267	563	0·21	75·73	117
Feb. 25...	W. J. Ireland..	1,187	279	566	0·26	76·19	145[1]
Mar. 11...	D. B. Gow.....	1,187	290	606	0·26	76·18	161[1]
Mar. 25...	M. S. Madden.	1,462	282	699	0·40	76·67	278[1]
Mar. 31.	C. O. Allen....	1,912	285	791	0·49	76·75	384[1]
April 14..	E. B. Patterson	1,469	209	1,008	1·13	76·67	1,140
May 8...	T. J. Moore..	1,197	202	781	1·03	76·26	803
June 14...	T. H. Boyd.	1,197	193	753	0·82	75·86	617
July 26..	"	1,197	194	699	0·84	75·78	587
Aug. 11..	"	1,197	194	772	0·87	75·86	671
Sept. 16...	H. H. Pratt...	1,496	174	646	0·56	75·34	364

[1] Ice Measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF ASSINIBOINE RIVER AT HEADINGLY FOR 1915.

(Drainage area 59,420 square miles.)

Day.	January.		February.		March.		April.		May		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	75·67	114	75·95	132	76·22	163	76·76	361	76·96	1,380	75·87	653
2	75·67	114	75·97	134	76·23	165	76·74	342	76·79	1,253	75·87	653
3	75·72	116	75·97	134	76·25	168	76·75	352	76·69	1,183	75·87	653
4	75·73	117	75·99	135	76·25	168	76·82	420	76·59	1,113	75·86	648
5	75·77	119	75·99	135	76·25	168	76·82	420	76·50	1,050	75·85	642
6	75·77	119	75·99	135	76·26	169	[1]76·82	500	76·37	966	75·87	653
7	75·77	119	76·02	138	76·25	168	[1]76·86	800	76·27	900	75·89	665
8	75·77	119	76·05	142	76·25	168	[1]76·87	800	76·27	900	75·92	682
9	75·72	116	76·05	142	76·25	168	[1]77·06	1,000	76·27	900	75·82	626
10	75·74	117	76·05	142	76·22	163	[1]77·27	1,100	76·28	907	75·87	653
11	75·74	117	76·07	144	76·24	166	[1]77·42	1,200	76·27	900	75·91	676
12	75·77	119	76·07	144	76·24	166	76·97	1,387	76·19	849	75·93	688
13	75·79	120	76·08	145	76·24	166	76·87	1,313	76·17	835	75·83	632
14	75·79	120	76·07	144	76·24	166	76·62	1,134	76·14	816	75·84	637
15	75·79	120	75·92	130	76·21	161	76·47	1,030	76·12	803	75·81	620
16	75·79	120	75·92	130	76·21	161	76·36	959	76·07	772	75·78	604
17	75·83	123	75·92	130	76·22	163	76·17	835	75·97	712	75·73	576
18	75·84	124	75·87	126	76·19	159	76·18	842	75·97	712	75·71	565
19	75·85	125	75·87	126	76·21	161	76·45	1,018	75·97	712	75·67	543
20	75·85	125	75·97	134	76·25	168	76·58	1,106	75·98	718	75·67	543
21	75·87	126	76·07	144	76·37	188	76·69	1,183	75·98	718	75·72	571
22	75·87	126	76·07	144	76·47	211	76·97	1,387	76·00	730	75·72	571
23	75·87	126	76·07	144	76·67	287	77·17	1,541	76·04	754	75·77	599
24	75·87	126	76·07	144	76·77	371	77·21	1,573	75·97	712	75·82	626
25	75·87	126	76·07	144	76·67	287	77·17	1,541	75·97	712	75·86	648
26	75·86	125	76·20	160	76·67	287	77·23	1,589	75·97	712	75·85	643
27	75·87	126	76·22	163	76·67	287	77·35	1,685	75·97	712	75·94	694
28	75·87	126	76·22	163	76·67	287	77·27	1,621	75·97	712	75·94	694
29	75·91	129	......	......	76·68	293	77·17	1,541	75·88	659	75·87	653
30	75·91	129	......	......	76·74	342	77·05	1,448	75·90	670	75·89	665
31	75·95	132	......	......	76·76	361	......	......	75·87	653	......	......

Day.	July.		August.		September.		October.		November.		December.	
1	76·16	829	76·07	772	75·19	295	75·58	494	75·47	435	75·77	
2	76·16	829	76·05	760	75·17	285	75·58	494	75·47	435	75·80	
3	76·11	796	76·10	790	75·17	285	75·57	488	75·45	425	75·82	
4	76·08	778	76·27	900	75·17	285	75·56	483	75·45	425	75·83	
5	76·07	772	76·20	855	75·12	260	75·53	465	75·45	425	75·81	
6	76·07	772	76·20	855	75·07	236	75·47	435	75·57	488	75·73	
7	76·04	754	76·08	778	75·17	285	75·37	385	75·55	477	75·72	
8	75·99	724	76·00	730	75·37	385	75·35	375	75·55	477	75·72	
9	75·97	712	75·90	670	75·29	345	75·33	365	75·55	477	75·72	
10	75·94	694	75·87	653	75·29	345	75·48	440	75·57	477	75·72	
11	75·96	706	75·86	648	75·35	375	75·55	477	75·59	500	75·72	
12	75·96	706	75·79	610	75·42	410	75·55	477	75·67	543	75·72	
13	75·87	653	75·77	699	75·37	385	75·47	435	75·65	533	75·72	
14	75·87	653	75·68	549	75·47	435	75·47	435	75·27	335	75·72	
15	75·82	626	75·57	488	75·42	410	75·45	425	75·17	.....	75·82	
16	75·77	599	75·67	543	75·34	370	75·42	410	75·27	.....	75·87	
17	75·74	582	75·47	435	75·37	385	75·43	415	75·17	...	75·86	
18	75·72	571	75·47	435	75·41	420	75·50	450	75·32	...	75·84	
19	75·78	604	75·47	435	75·45	425	75·50	450	75·51	..	75·83	
20	75·78	604	75·46	430	75·47	435	75·45	425	75·42	.	75·82	
21	75·76	593	75·42	410	75·46	430	75·37	385	75·56		75·82	
22	75·75	587	75·36	380	75·38	390	75·37	385	75·66		75·82	
23	75·77	599	75·37	385	75·39	395	75·37	385	75·72	.	75·82	
24	75·72	571	75·37	385	75·45	425	75·38	390	75·72		75·84	
25	75·67	543	75·27	335	75·47	435	75·53	466	75·72		75·87	
26	75·77	599	75·27	335	75·48	440	75·57	488	75·70		75·89	
27	75·70	560	75·27	335	75·57	488	75·55	477	75·67	..	75·92	
28	75·68	549	75·27	335	75·57	488	75·48	440	75·68		75·92	
29	75·80	615	75·26	330	75·53	466	75·48	440	75·76		75·96	
30	75·97	712	75·22	310	75·52	461	75·50	450	75·78		75·97	
31	76·08	778	75.27	335	...	......	75·47	435			75·98	

NOTE—All gauge heights marked thus(1) interpolated.
Ice conditions from January 1 to April 11

Monthly Discharge of Assiniboine River at Headingly for the Year 1915.

[Drainage area 59,420 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet
January	132	114	122	0·002	0·002	7,500
February	163	126	140	0·002	0·002	7,800
March	371	159	210	0·004	0·005	12,900
April	1,685	342	1,070	0·018	0·020	63,700
May	1,380	653	843	0·014	0·016	51,800
June	694	543	632	0·011	0·012	37,600
July	829	543	667	0·011	0·013	41,000
August	900	310	545	0·009	0·011	33,500
September	488	236	382	0·006	0·007	22,700
October	494	365	438	0·007	0·008	26,900
November			[1]350	0·006	0·007	20,800
December			[1]160	0·003	0·004	9,800
The Year	1,685	114	463	0·008	0·107	336,000

Note.—All marked thus (1) are estimated.

SHELL RIVER.

The Shell river is one of the largest tributaries of the Assiniboine, emptying into that river in Tp. 23, R. 29, W.P.M. The source of the river is on the northwestern slope of the Duck mountains, which it parallels for a considerable distance, the course being almost due south for the entire length of the river. About five miles from the junction with the Assiniboine it turns sharply to the west and flows in that direction to its mouth.

The watershed drained is narrow, lying between that of the Valley and the Assiniboine, except at the upper part, where it opens out to a width of about thirty-five miles. The total length of the basin being about sixty miles, though the river itself has a length of ninety miles.

In the upper part of the basin the river flows through the Duck Mountain forest reserve, a district in which valuable timber is to be found. The valley of the river is narrow and quite deep, varying between one hundred and three hundred and fifty feet. The valley itself is gravelly and boulder strewn, but the land forming the upper benches and table land is good for agriculture.

At Asessippi, the only town located on the stream, a small flour mill was operated by water power from 1884 to 1911, in which year the dam was washed out.

SHELL RIVER AT ASESSIPPI.

HISTORY.

The first metering of the Shell at Asessippi was taken by W. J. Ireland on September 15, 1913, but the point at which the measurement was made was not considered suitable for a permanent section. This point was at the bridge just below the dam. A second section was established by E. J. Budge on January 16, 1914, one-quarter mile below the bridge, this latter section was afterwards abandoned for one which was located by C. O. Allen on June 9, 1914.

LOCATION OF SECTION.

The section finally located on the Shell river at Asessippi is one and one-quarter miles downstream from the Asessippi bridge, two miles below the mouth of Bear creek, thirteen and one-half miles from Russell and twenty miles south of Roblin. The I.P. is marked by a nail driven in the base of a blazed tree which is on the right bank.

RECORDS AVAILABLE.

Daily gauge heights have been obtained since June 9, 1914, and estimates of daily discharge for the same period have been made.

DRAINAGE AREA.

The area tributary to the Shell above the meter section is 930 square miles. It lies between the watersheds of the Valley river on the east and the Assiniboine on the west.

GAUGE.

A six-foot vertical staff gauge was placed six hundred feet downstream from D. Martel's house and about one mile above the meter section. The gauge is referred to a B.M., which is a nail driven into the foot of a blazed scrub oak tree standing fourteen feet back from the gauge. The datum is arbitrary. On November 18, it was discovered that back water effect was being caused between the gauge and the meter section by beaver dams. A new gauge was therefore established at the meter section, which was referred to a temporary bench mark placed on the side of a blazed 6-inch poplar tree standing one hundred feet above the meter station on the right bank.

CHANNEL.

For sixty feet above the section and one hundred and fifty feet below the channel is straight. The bottom is of small rock and gravel and is permanent. The banks are high and clear and are not liable to overflow. The current is swift.

DISCHARGE MEASUREMENTS.

Measurements are made by means of a cable carrier travelling on a cable stretched across the stream at the section. Sufficient measurements have been taken to define a discharge curve.

ACCURACY.

The curve is well defined over a range in stage of 1·3 feet for open water conditions. Discharge curve for winter conditions is not so well defined.

DISCHARGE MEASUREMENTS OF SHELL RIVER AT ASESSIPPI, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet	Sec. ft
Jan. 20.	M. S. Madden..	1,462	28	15·9	0·80	93·42	12·6[1]
Mar. 16	"	1,462	31	20·7	0·91	94·67	20·7[1]
April 17.	C. O. Allen..	1,912	45	91·3	3·28	92·94	300·2
April 28.	"	1,912	39	63·9	2·68	91·73	171·2
May 13	"	2,018	39	52·9	1·99	91·39	105·3
June 4	"	2,018	38	47·1	2·03	91·19	95·5
July 29	T. H. Boyd.	1,197	38	46·2	2·14	91·43	98·9
Sept. 4	"	1,197	34	36·1	1·46	90·95	53·1
Oct., 26	C. O. Allen.	1,374	36	40·2	1·65	91·40	66·3

[1] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF SHELL RIVER AT ASESSIPPI FOR 1915.

[Drainage area 930 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft	Feet.	Sec. ft.	Feet.	Sec. ft
1	92·87	....	92·87	....	94·05	....	94·63	.	91·69	158	91·25	79
2	92·17	....	92·87	....	93·85	....	94·63		91·65	150	91·25	79
3	92·47	....	92·98	....	93·85	....	94·43		91·61	142	91·24	78
4	92·58	....	92·98	....	93·85	....	94·12	.	91·57	134	91·24	78
5	92·58	....	93·08	....	93·85		94·82	.	91·52	124	91·26	80
6	92·68	.	92·99	....	93·65	....	94·72		91·43	107	91·28	83
7	92·69	.	98·99	....	93·65	....	94·52		91·44	109	91·36	96
8	92·69		92·99	....	93·65	....	94·32	....	91·42	106	91·38	99
9	92·69	....	92·90	....	93·65	....	94·12		91·39	100	91·40	102
10	92·50	.	92·90	....	93·65	....	94·02		91·32	89	91·43	107
11	92·60		92·90	....	93·85	....	93·82		91·35	94	91·46	113
12	92·60		92·90	....	93·84	....	93·72	.	91·34	92	91·48	116
13	92·91	.	92·81	.	94·04	.	93·62		91·39	100	91·48	116
14	93·21		92·81	....	94·14	....	93·42		91·38	99	91·48	116
15	93·21	....	92·81		94·24	.	93·12		91·36	96	91·48	116
16	93·22	....	92·81		94·24		93·62		91·36	96	91·48	116
17	93·22	....	92·92	....	94·61		92·91	402	91·36	96	91·47	115
18	93·42	....	92·62	.	94·94		92·61	342	91·35	94	91·47	115
19	93·43	....	94·02	.	94·91	.	92·11	242	91·34	92	91·46	113
20	93·43	13	94·02	....	95·04		92·11	242	91·32	89	91·46	113
21	93·43	....	94·03	....	95·04	.	92·01	222	91·30	86	91·47	115
22	93·44	....	94·03	....	95·04		91·91	202	91·29	85	91·48	116
23	93·44	....	94·03	.	95·03	.	91·91	202	91·28	83	91·48	116
24	93·24	....	94·03	.	95·13		91·81	182	91·27	82	91·48	116
25	93·15	.	94·04	....	94·93	.	91·81	182	91·26	80	91·47	115
26	93·15		94·04	....	94·93	....	91·81	182	91·26	80	91·46	113
27	93·15	.	94·04	....	94·93	....	91·81	182	91·26	80	91·45	111
28	93·06	....	94·04	....	94·83	....	91·71	162	91·26	80	91·43	107
29	93·06	....			94·83	....	91·71	162	91·26	80	91·40	102
30	92·96	.		.	94·73	....	91·69	158	91·26	80	91·38	99
31	92·87	....	.		94·63	....	....	....	91·26	80		

Day.	July.		August.		September.		October.		November.		December.	
1	91·37	97	91·30	86	90·88	37	91·33	91	91·40	102	91·38	
2	91·36	96	91·26	80	90·93	42	91·34	92	91·40	102	91·38	
3	91·38	99	91·24	78	90·95	43	91·35	94	91·40	102	91·38	
4	91·38	99	91·22	75	90·95	43	91·36	96	91·40	102	91·38	
5	91·38	99	91·18	69	90·93	42	91·36	96	91·28	83	91·38	
6	91·38	99	91·14	64	90·92	41	91·36	96	91·18	69	91·38	
7	91·38	99	91·14	64	90·90	39	91·36	96	91·18	69	91·38	
8	91·41	104	91·14	64	91·03	51	91·36	96	91·38	99	91·38	
9	91·44	109	91·14	64	91·06	55	91·36	96	91·38	99	91·38	
10	91·41	104	91·14	64	91·08	57	91·36	96	91·38	99	91·38	
11	91·48	116	91·13	63	91·10	59	91·36	96	91·38		91·38	
12	91·48	116	91·13	63	91·13	63	91·36	96	91·38		91·38	
13	91·48	116	91·13	63	91·16	67	91·37	97	91·58		91·38	
14	91·48	116	91·11	60	91·15	65	91·37	97	91·58		91·38	
15	91·50	120	91·10	59	91·14	64	91·37	97	91·58		91·38	
16	91·56	132	91·08	57	91·14	64	91·37	97	91·18		91·38	
17	91·58	136	91·06	55	91·14	64	91·37	97	91·38		91·38	
18	91·64	148	91·04	52	91·14	64	91·38	99	91·38		91·38	
19	91·70	160	91·02	50	91·14	64	91·38	99	91·38		91·38	
20	91·76	172	90·98	46	91·18	69	91·38	99	91·38		91·38	
21	91·78	176	90·97	45	91·20	72	91·38	99	91·38		91·38	
22	91·80	180	90·96	44	91·20	72	91·38	99	91·38		91·38	
23	91·78	176	90·95	43	91·20	72	91·38	99	91·38		91·48	
24	91·74	168	90·94	43	91·22	75	91·38	99	91·38		91·48	
25	91·68	156	90·92	41	91·26	80	91·38	99	91·38		91·48	
26	91·58	136	90·91	40	91·28	83	91·39	100	91·30		91·48	
27	91·53	126	91·00	48	91·28	83	91·39	100	91·38		91·48	
28	91·48	116	90·88	37	91·30	86	91·39	100	91·38		91·48	
29	91·44	109	90·88	37	91·31	88	91·39	100	91·38		91·48	
30	91·38	99	90·88	37	91·31	88	91·40	102	91·38		91·48	
31	91·33	91	90·88	37			91·40	102	.		91·48	

NOTE—Ice conditions January 1 to April 17, and November 11 to December 31.
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF SHELL RIVER AT ASESSIPPI FOR THE YEAR 1915.
[Drainage area 930 square miles.]

MONTH.	Discharge in Second-Feet				Run-Off	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet
January	....		[1]10	0·011	0·013	615
February	....		[1]15	0·016	0·017	833
March	....		[1]25	0·027	0·031	1,540
April	402		[1]160	0·172	0·192	9,500
May	158	80	99	0·106	0·122	6,100
June	116	78	105	0·113	0·126	6,250
July	180	91	125	0·134	0·155	7,700
August	86	37	56	0·060	0·069	3,450
September	88	37	63	0·068	0·076	3,750
October	102	91	97	0·104	0·120	5,950
November	....	....	[1]70	0·076	0·085	4,175
December	....		[1]30	0·033	0·038	1,850
The Year	402	....	63	0·077	1·044	51,713

NOTE.—Marked thus (1) estimated.

BIRDTAIL CREEK.

Birdtail Creek is one of the small tributaries of the Assiniboine river. It joins the latter in Indian Reserve No. 57. The source of the river is on the south slope of the Riding mountains and the course is generally south from the headwaters to the mouth.

The upper part of the drainage area, which is 400 square miles, is very well timbered, and lumbering has been carried on in the district. Towards the mouth the land is given up to agriculture.

There was some question of a small power development on the river, so records of the discharge have been kept. These show that the power output would be very small and subject to interruption during the winter months.

BIRDTAIL CREEK AT BIRTLE.

HISTORY.

This station was established May 14, 1914, by C. O. Allen.

LOCATION OF SECTION.

The meter section is located on the downstream side of the Birtle traffic bridge, on the road between the C.P.R. station and the town of Birtle, one mile from the C.P.R. The I.P is painted on the handrail of the bridge at the left end on the downstream side.

RECORDS AVAILABLE.

The estimates of daily discharge have been deduced for the open water seasons of 1914 and 1915.

DRAINAGE AREA.

The drainage area is 400 square miles, extending from the Riding mountains southeast to the Assiniboine.

GAUGE.

A vertical staff gauge is secured to the floor of the bridge and is referred to a permanent M.H.S. B.M. This B.M. is set to an arbitrary datum about forty feet northeast of the upstream north end of the bridge.

CHANNEL.

The stream is confined to one channel at all stages; for two hundred and fifty above and one hundred feet below the section the channel is straight. The current is fairly swift and the banks are high and clear and not liable to overflow. The bottom of the stream is of mud and hard clay, not liable to shift.

DISCHARGE MEASUREMENTS.

The measurements are taken from the downstream side of the traffic bridge under open water conditions. For winter conditions measurements are made from the ice.

ACCURACY.

The discharge curve is only fairly well defined over a range in gauge height of three feet, extending from 88·5 to 91·5.

DISCHARGE MEASUREMENTS OF BIRDTAIL CREEK AT BIRTLE, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 22	M. S. Madden	1,462	21·0	9·0	....	88·23	..........[1]
Mar. 18	"	1,462	12·0	5·6	....	....	..........[1]
April 19	C. O. Allen	1,912	52·1	104·5	0·67	89·10	69·7
April 29	"	1,912	48·5	87·4	0·44	88·62	38·1
May 11	"	2,018	47·5	79·7	0·28	88·67	22·2
May 31	"	2,018	46·5	78·3	0·31	88·63	24·3
July 31	T. H. Boyd	1,197	48·2	74·0	0·26	88·76	19·2
Sept. 1	"	1,197	46·2	67·8	....	88·48	..........[1]
Oct. 27	C. O. Allen	1,374	55·5	92·6	0·28	88·92	25·9

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[1] No discharge.

Daily Gauge Height and Discharge of Birdtail Creek at Birtle for 1915.

[Drainage area 400 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1									88·75	30	88·65	18
2									88·75	30	88·60	13
3									88·75	30	88·60	13
4									88·75	30	88·60	13
5									88·70	24	88·65	18
6									88·70	24	88·65	18
7									88·65	18	88·65	18
8									88·65	18	88·65	18
9									88·65	18	88·65	18
10									88·65	18	88·70	24
11									88·67	21	88·70	24
12									88·70	24	88·70	24
13									88·70	24	88·70	24
14									88·70	24	88·75	29
15									88·75	29	88·80	35
16									88·80	35	88·85	40
17									88·80	35	88·80	35
18									88·85	41	88·80	35
19							89·10	69	88·85	41	88·80	35
20							89·01	58	88·80	35	88·85	40
21							89·01	58	88·80	35	88·85	40
22	88·23						89·01	58	88·75	30	88·90	46
23							88·96	53	88·70	24	88·90	46
24							88·96	53	88·70	24	88·95	51
25							88·96	53	88·65	18	89·00	57
26							88·96	53	88·65	18	89·05	63
27							88·91	47	88·65	18	89·05	63
28							88·91	47	88·65	18	89·00	57
29							88·91	47	88·65	18	88·95	51
30							88·90	46	88·65	18	88·95	51
31								.....	88·65	18	..	.

Day.	July.		August.		September.		October.		November.		December	
1	88·95	51	88·74	28	88·44	....	88·94	50	89·00	68		
2	88·95	51	88·69	23	88·44	......	88·94	50	89·14	74		
3	88·95	51	88·64	17	88·44	...	88·99	56	89·14	74		
4	88·95	51	88·64	17	88·44	......	89·04	62	89·09	68		
5	88·95	51	88·64	17	88·44	......	89·04	62	89·04	62		
6	88·90	46	88·59	12	88·44	1	89·04	62	88·99	56		
7	88·90	46	88·59	12	88·49	1	89·04	62	88·94	50		
8	88·85	40	88·54	6	88·49	1	88·99	56	88·94	50		
9	88·85	40	88·54	6	88·54	6	88·99	56	88·99	56		
10	88·80	35	88·54	6	88·68	21	88·99	56	88·99	56		
11	88·80	35	88·54	6	88·74	28	88·99	56	88·99	56		
12	88·75	29	88·49	1	88·74	28	88·99	56	88·99	56		
13	88·75	29	88·49	1	88·74	28	88·94	50	88·94			
14	88·75	29	88·49	1	88·79	34	88·94	50	88·94			
15	88·75	29	88·49	1	88·79	34	88·94	50	88·94			
16	88·80	35	88·49	1	88·79	34	88·89	45	88·99			
17	88·80	35	88·49	1	88·74	28	88·89	45	88·99			
18	88·95	51	88·44		88·74	28	88·89	45	88·99			
19	89·20	81	88·44		88·74	28	88·89	45	88·99			
20	89·25	87	88·44		88·79	34	88·84	39	88·99			
21	89·25	87	88·44		88·79	34	88·84	39	88·99			
22	89·20	81	88·39		88·79	34	88·84	39	88·99			
23	89·20	81	88·39		88·79	34	88·79	34	88·94			
24	89·15	75	88·39		88·84	39	88·79	34	88·94			
25	89·05	63	88·34		88·84	39	88·84	39	88·94			
26	88·95	51	88·34		88·81	39	88·89	45	88·94			
27	88·85	40	88·34		88·84	39	88·89	45	88·94			
28	88·80	35	88·39		88·89	45	88·94	50	88·99			
29	88·75	29	88·39		88·89	45	88·99	56	88·99			
30	88·75	29	88·39		88·89	45	88·99	56	88·99			
31	88·76	31	88·39				89·04	62				

MONTHLY DISCHARGE OF BIRDTAIL CREEK AT BIRTLE FOR THE YEAR 1915.

[Drainage area 400 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]0	....	....	
February	....	..	[1]0	....	....	
March	....	..	[1]0	....	....	....
April	....	....	[1]45	0·112	0·125	2,678
May	41	18	25	0·062	0·071	1,537
June	63	13	34	0·085	0·095	2,023
July	87	29	49	0·122	0·140	3,013
August	28	0	5	0·012	0·014	307
September	45	0	24	0·060	0·067	1,428
October	62	34	50	0·125	0·144	3,074
November	..	..	[1]45	0·112	0·125	2,678
December	..	.	[1]20	0·050	0·058	1,230
The Period	87	0	25	0·062	0·839	17,968

NOTE.—All marked thus (1) estimated.

LITTLE SASKATCHEWAN RIVER.

The source of the Little Saskatchewan river is on the southern slope of the Riding mountains. It flows in a general southeastern direction until it reaches the town of Minnedosa in Tp. 15, R. 18, W.P.M. at which point it turns and flows almost southwest to its junction with the Assiniboine river in Tp. 10, R. 20, W.P.M. about eight miles west of the city of Brandon.

The drainage area is 1,640 square miles. In the upper part of the basin there are numerous small lakes, and in this section the greater part of the drainage is obtained. The largest tributary, the Rolling river, enters the Little Saskatchewan about thirteen miles above Minnedosa.

In the upper waters the country is covered to a considerable extent by stands of good merchantable timber, a considerable portion of which is within the forest reserve. The rest of the country drained is very well settled, the land offering splendid opportunity for agriculture.

The river valley is well defined, lying between 100 and 300 feet below the general level of the surrounding country. It varies in width between one-quarter of a mile and one and one-quarter miles, the course of the river in the valley bottom being very sinuous, almost doubling its length over the total length of the drainage basin.

A number of small towns are to be found along the course of the river, as Rivers, Gautier, Rapid City, Riverdale and Minnedosa, the latter having a population of about 1,700. There are possible power sites on the river, three of which have been developed, these are at Minnedosa, Rapid City and the Brandon Power Company's plant about two miles from the mouth of the river.

LITTLE SASKATCHEWAN RIVER AT MIDDLETON BRIDGE.

HISTORY.

A metering station was established on the Little Saskatchewan at Middleton Bridge on May 17, 1915, by E. B. Patterson, and from that date this station has been in operation.

LOCATION OF SECTION.

The metering section is located on the downstream side of what is locally known as Middleton bridge, situated in Sec. 6, Tp. 20, R. 20, W.P.M., and approximately eighteen miles north of the town of Elphinstone. The Initial Point is painted on the east end of the handrail of the bridge.

RECORDS AVAILABLE.

Daily gauge readings have been taken from the time of the establishment of the station to the end of the year 1915. Discharge measurements have been made at various stages throughout this period, and from these estimated daily discharges have been computed for a period from May 17 to November 9, 1915. From the latter date to the end of the year ice cover conditions prevailed, and the information obtained is not sufficient to allow the estimating of daily discharges.

DRAINAGE AREA.

The drainage area tributary to the river at this metering station is 184 square miles.

GAUGE.

A six-foot vertical staff gauge has been secured to a pile on the drownstream side of the bridge near the left bank. This gauge is referred to a B.M. on a 10-inch blazed poplar tree, twenty feet west of the bridge on the north side of the road. This B.M. is set to an arbitrary datum.

CHANNEL.

The section of the river on which the station is located is curved both above and below, but the current is sluggish and even across the section. On account of the bridge embankment the entire flow of the stream must cross the section even under high water conditions.

DISCHARGE MEASUREMENTS.

The discharge measurements are taken by wading during low water and from the bridge when medium or high water conditions prevail.

ACCURACY.

Throughout the stage met with during the time observations have been made on the river at this point the discharge curve is not well defined.

Discharge Measurements of Little Saskatchewan River at Middleton Bridge, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
May 17.	E. B. Patterson..	1,920	18	6·1	1·37	88·56	8·3	Not regular sec.
May 25.	"	1,920	18	6·1	0·73	88·47	4·4	" "
May 28.	"	1,920	22	5·5	0·66	88·45	3·6	" "
May 29.	"	1,920	18·5	5·6	0·60	88·44	3·4	" "
June 2.	"	1,920	19	5·5	0·41	88·39	2·4	" "
June 5.	"	1,920	90	81·6	0·67	89·27	46·3	Regular section.
June 16.	"	1,920	21	8·4	0·64	88·63	5·4	1 mile above regular.
July 24.	G. K. Gainsford..	1,435	98	131·2	0·28	89·87	37·2	Regular section.
Aug. 24.	H. H. Pratt......	1,496	98	63·0	0·15	89·15	9·6	
Sept. 25.	G. K. Gainsford..	1,196	96	76·3	0·15	89·25	11·4	
Nov. 6.	" ..	1,196	99	63·5	0·32	89·17	20·3	

DAILY GAUGE HEIGHT AND DISCHARGE OF LITTLE SASKATCHEWAN RIVER AT MIDDLETON BRIDGE FOR 1915.

[Drainage area 184 square miles.]

Day.	January.		February.		March.		April.		May		June	
	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1											88·39	3
2											88·38	3
3											88·39	3
4											88·39	3
5											90·06	46
6											90·16	51
7											90·16	51
8											89·71	30
9											89·37	20
10											89·26	18
11											89·26	18
12											89·26	18
13											88·96	11
14											88·61	6
15											88·61	6
16											88·61	6
17									88·46	4	88·66	6
18									88·56	5	88·63	6
19									88·51	1	88·61	6
20									88·51	4	88·63	6
21									88.51	4	88·81	9
22									88·50	4	88·81	9
23									88·49	4	88·86	9
24									88·49	4	88·81	9
25									88·48	4	88·81	9
26									88·46	4	88·76	8
27									88·45	4	89·01	12
28									88·45	4	88·96	11
29									88·45	4	88·96	11
30									88·44	3	88·96	11
31									88·44*	3		

Day.	July.		August.		September.		October.		November.		December	
1	88·76	8	89·86	36	88·86	9	89·26	17	89·26	17	89·06	
2	88·76	8	89·81	34	88·86	9	89·26	17	89·26	17	89·06	
3	88·71	7	89·71	30	88·81	9	89·36	20	89·26	17	89·06	
4	88·81	9	89·66	29	88·76	8	89·36	20	89·26	17	89·06	
5	88·81	9	89·66	29	88·76	8	89·36	20	89·16	15	89·06	
6	88·68	7	89·66	29	88·76	8	89·36	20	89·16	15	89·06	
7	88·66	6	89·66	29	88·86	9	89·36	20	89·06	13	89·06	
8	88·56	5	89·66	29	88·96	11	89·36	20	89·06	13	89·06	
9	88·66	6	89·66	29	89·16	15	89·36	20	89·06	13	89·06	
10	88·71	7	89·56	26	89·16	15	89·26	17	89·06		89·06	
11	89·51	24	89·56	26	89·16	15	89·26	17	89·06		89·06	
12	89·86	36	89·56	26	89·11	11	89·26	17	89·06		89·06	
13	89·86	36	89·46	23	89·06	13	89·26	17	89·06		88·96	
14	89·86	36	89·46	23	89·26	17	89·16	15	89·06		88·86	
15	89·91	39	89·46	23	89·36	20	89·16	15	89·06		88·76	
16	89·96	41	89·46	23	89·36	20	89·16	15	89·06		88·66	
17	89·91	39	89·46	23	89·36	20	89·16	15	89·06		88·66	
18	89·91	39	89·46	23	89·26	17	89·06	13	89·06		88·66	
19	89·91	39	89·46	23	89·46	23	89·06	13	89·06		88·66	
20	89·86	36	89·36	20	89·46	23	89·06	13	89·06		88·56	
21	89·86	36	89·36	20	89·36	20	89·06	13	89·06		88·56	
22	89·86	36	89·36	20	89·36	20	89·06	13	89·06		88·56	
23	89·86	36	89·36	20	89·36	20	89·06	13	89·06		88·56	
24	89·76	32	89·16	15	89·26	17	89·06	13	89·06		88·46	
25	89·86	36	89·06	13	89·26	17	89·06	13	89·06		88·46	
26	89·86	36	89·06	13	89·26	17	89·16	15	89·06		89·46	
27	89·86	36	89·06	13	89·26	17	89·26	17	89·06		89·11	
28	89·76	32	89·06	13	89·31	18	89·26	17	89·06		89·11	
29	89·76	32	88·96	11	89·36	20	89·26	17	89·06		89·11	
30	89·76	32	88·96	11	89·26	17	89·26	17	89·06		89·11	
31	89·76	32	88·86	9			89·26	17			89·41	

Station established May 17.

NOTE.—Ice conditions from November 10 to end of year.
Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF LITTLE SASKATCHEWAN RIVER AT MIDDLETON BRIDGE FOR PERIOD MAY—NOVEMBER, 1915.

[Drainage area 184 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
May			[1]5	0·027	0·031	307
June	51	3	14	0·076	0·085	833
July	41	5	26	0·041	0·163	1,600
August	36	9	22	0·120	0·138	1,350
September	23	8	16	0·087	0·097	952
October	20	13	16	0·087	0·100	984
November			[1]9	0·049	0·055	536
December						
The Period	51	3	15	0·084	0·669	6,562

NOTE.—Marked thus ([1]) estimated.

LITTLE SASKATCHEWAN AT ELPHINSTONE.

HISTORY.

A metering station was established on the Little Saskatchewan near Elphinstone on May 10, 1915, by E. B. Patterson, and observations have been carried on at this station since that date.

LOCATION OF SECTION.

The section is located on the downstream side of the traffic bridge known as Indian bridge, one and one-half miles north of the town of Elphinstone. The I.P. is painted on the handrail at the west end of the bridge.

RECORDS AVAILABLE.

From May 10, 1915, to the end of the year daily gauge heights have been recorded, and at various times discharge measurements have been made covering the greater part of the range in stage recorded by the daily gauge height. Estimates of daily discharge have been made for the period from May 10 to November 13. From November 13 to the end of the year ice cover conditions obtained, and sufficient information has not been secured to allow the estimating of daily discharges for this period.

DRAINAGE AREA.

The drainage area tributary to the river at this point is 380 square miles.

GAUGE.

A six-foot enamelled staff gauge has been secured to a pile on the upstream side of the gauge near the left bank. This gauge is referred to a B.M. located fifty-five feet east of the bridge. The B.M. is set to an arbitrary datum.

CHANNEL.

The channel is straight for about one hundred feet below the section, but above it is curved for about three hundred feet; the right bank above and below the section is liable to overflow during high water, but the embankment would prevent overflow at the section. The bed of the stream is composed of boulders and not liable to shift.

DISCHARGE MEASUREMENTS.

The discharge measurements at this station are taken either by wading during low water or from the bridge during high water.

ACCURACY.

Throughout the range in stage recorded by the daily gauge height the discharge curve is well defined.

Discharge Measurements of Little Saskatchewan River at Indian Bridge, Elphinstone, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
May 10...	E. B. Patterson....	1,920	21	21·7	0·73	93·42	15·9
May 18...	"	1,920	24	23·4	0·99	93·53	23·2
May 26...	"	1,920	24	18·8	0·67	93·41	12·6
May 27...	"	1,920	24	21·0	0·69	93·40	14·4
May 28...	"	1,920	27	16·1	0·96	93·40	15·5[1]
June 7..	"	1,920	74	47·2	1·16	93·86	54·9
June 17...	"	1,920	25	21·5	0·76	93·50	16·4
July 24...	G. K. Gainsford....	1,435	69	55·2	1·37	93·92	75·6
Aug. 24...	H. H. Pratt........	1,496	35	21·4	1·25	93·59	26·8
Sept. 25...	G. K. Gainsford...	1,196	69	48·6	1·21	93·82	58·8
Nov. 6...	"	1,196	69	48·7	1·05	93·81	51·1

[1] Not at regular section.

DAILY GAUGE HEIGHT AND DISCHARGE OF LITTLE SASKATCHEWAN RIVER AT INDIAN BRIDGE, ELPHINSTONE, FOR 1915.

[Drainage area 380 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	....	....	....	....	....	....	....	....	....	....	93·41	15
2	....	....	....	....	....	....	....	....	....	....	93·40	15
3	....	....	....	....	....	....	....	....	....	....	93·39	14
4	....	....	....	....	....	....	....	....	....	....	93·38	14
5	....	....	....	....	....	....	....	....	....	....	93·59	26
6	....	....	....	....	....	....	....	....	....	....	93·77	46
7	....	....	....	....	....	....	....	....	....	....	93·86	61
8	....	....	....	....	....	....	....	....	....	....	93·84	57
9	....	....	....	....	....	....	....	....	....	....	93·86	61
10	....	....	....	....	....	....	....	....	93·42	16	93·87	63
11	....	....	....	....	....	....	....	....	93·45	17	93·85	59
12	....	....	....	....	....	....	....	....	93·49	19	93·78	47
13	....	....	....	....	....	....	....	....	93·49	19	93·64	31
14	....	....	....	....	....	....	....	....	93·49	19	93·58	26
15	....	....	....	....	....	....	....	....	93·53	22	93·52	21
16	....	....	....	....	....	....	....	....	93·57	25	93·51	21
17	....	....	....	....	....	....	....	....	93·54	23	93·50	20
18	....	....	....	....	....	....	....	....	93·53	22	93·49	19
19	....	....	....	....	....	....	....	....	93·49	19	93·48	19
20	....	....	....	....	....	....	....	....	93·48	19	93·51	21
21	....	....	....	....	....	....	....	....	93·45	17	93·59	26
22	....	....	....	....	....	....	....	....	93·43	16	93·59	26
23	....	....	....	....	....	....	....	....	93·42	16	93·61	28
24	....	....	....	....	....	....	....	....	93·43	16	93·60	27
25	....	....	....	....	....	....	....	....	93·41	15	93·62	29
26	....	....	....	....	....	....	....	....	93·40	15	93·67	34
27	....	....	....	....	....	....	....	....	93·40	15	93·74	42
28	....	....	....	....	....	....	....	....	93·41	15	93·78	47
29	....	....	....	....	....	....	....	....	93·44	17	93·70	37
30	....	....	....	....	....	....	....	....	93·42	16	93·66	33
31	....	....	....	....	....	....	....	....	93·42	16	....	....

	July.		August.		September.		October.		November.		December.	
1	93·64	31	93·82	54	93·44	17	93·82	54	93·84	57	94·09	....
2	93·61	28	93·81	52	93·43	16	93·83	55	93·83	55	94·24	....
3	93·60	27	93·77	46	93·47	18	93·86	61	93·81	52	94·12	....
4	93·59	26	93·72	40	93·45	17	93·87	63	93·77	46	93·99	
5	93·59	26	93·72	40	93·44	17	93·86	61	93·76	45	94·02	
6	93·55	24	93·70	37	93·45	17	93·86	61	93·80	50	94·12	
7	93·52	21	93·68	35	93·52	21	93·86	61	93·74	42	94·14	
8	93·50	20	93·67	34	93·62	29	93·84	57	93·72	40	94·22	
9	93·50	20	93·66	33	93·63	30	93·82	54	[1]93·73	41	94·29	
10	93·51	21	93·62	29	93·66	33	93·81	52	[1]93·74	42	94·30	
11	93·56	24	93·61	28	93·60	27	93·81	52	[1]93·75	44	94·24	
12	93·67	34	93·61	28	93·60	27	93·81	52	[1]93·76	45	94·33	
13	93·93	75	93·60	27	93·60	27	93·80	50	93·77	46	94·35	
14	93·95	80	93·59	26	93·71	38	93·79	49	93·85		94·39	
15	93·90	90	93·57	25	93·75	44	93·79	49	93·83		94·43	
16	94·08	112	93·55	24	93·76	45	93·79	49	93·89		94·40	
17	94·07	110	93·54	23	93·76	45	93·79	49	93·90		94·37	
18	94·05	105	93·53	22	93·77	46	93·79	49	93·91		94·41	
19	94·03	100	93·52	21	93·78	47	93·79	49	93·91		94·42	
20	94·01	95	93·51	21	93·81	52	93·78	47	93·92		94·43	
21	93·99	90	93·73	41	93·84	57	93·78	47	93·92		94·47	
22	93·97	85	93·66	33	93·83	55	93·75	44	93·90		94·55	
23	93·95	80	93·60	27	93·82	54	93·75	44	93·85		94·57	
24	93·92	72	93·57	25	93·81	52	93·75	44	93·92		94·57	
25	93·90	68	93·53	22	93·82	54	93·82	54	93·92		94·58	
26	93·88	64	93·52	21	93·81	52	93·78	47	93·92		94·58	
27	93·85	59	93·50	20	93·81	52	93·82	54	93·91		94·59	
28	93·83	55	93·49	19	93·81	52	93·86	61	93·92		94·71	
29	93·82	54	93·48	19	93·82	54	93·91	70	93·99		94·75	
30	93·78	47	93·49	19	93·84	57	93·86	61	94·02	..	94·79	
31	93·77	46	93·46	18		.	93·86	61			94·82	

NOTE.—Gauge heights marked thus (1) interpolated.
Ice conditions from November 14 to December 31.
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF LITTLE SASKATCHEWAN RIVER AT INDIAN BRIDGE, ELPHINSTONE, FOR 1915.

[Drainage area 380 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
May	....	....	[1]16	0·042	0·048	984
June	63	14	33	0·087	0·097	1,960
July	112	20	58	0·153	0·176	3,575
August	54	18	29	0·076	0·088	1,780
September	57	16	38	0·100	0·112	2,260
October	70	41	54	0·142	0·164	3,325
November	....	....	[1]30	0·079	0·088	1,780
December	....	....	[1]5	0·013	0·015	307
The Period	112	14	33	0·086	0·788	15,971

NOTE.—Marked thus ([1]) estimated.

CLEAR CREEK.

Clear Creek is one of the tributaries of the Little Saskatchewan in the northerly section of the drainage area. Its source is in Clear lake, from which it derives its name, and from a point at the westerly end of the lake in Tp. 20, R.19, W.P.M., it flows almost due west for a distance of nine miles to its junction with the Little Saskatchewan.

The importance of this creek lies mainly in the fact of its being the outlet of Clear lake. At its head a storage dam has been built to conserve the run-off from the area tributary to the lake, for the use of the power developments on the Little Saskatchewan.

CLEAR CREEK ABOVE JUNCTION WITH LITTLE SASKATCHEWAN.

HISTORY.

A metering station was established on Clear creek by E. B. Patterson on May 31, 1915, and from that time to the end of the year the station has been operated.

LOCATION OF SECTION.

The section is located on the creek one mile upstream from its junction with the Little Saskatchewan. The Initial Point is a three-inch poplar post, three feet from the water's edge on the right bank, and indicated by the painted letters "I.P."

RECORDS AVAILABLE.

From the time of the establishment of the station gauge readings have been made tri-weekly. Sufficient meterings have been made to define a discharge curve covering the range in stage met with, and estimated daily discharges are available to the end of 1915.

DRAINAGE AREA.

The drainage area tributary to the creek at the metering station is ninety-five square miles.

GAUGE.

The gauge at this station is a six-foot enamelled staff gauge secured to a post driven into the bed of the creek and braced. This gauge is referred to a B.M. set to an arbitrary datum, located 50 feet northeast of Initial Point. The bench mark is a four-inch poplar stump painted red, marked "M.H.S. B.M. El. 100.00."

CHANNEL.

The stream throughout its course is very sinuous, but the station is located at a point where the channel is fairly straight. The bed of the stream is gravelly and not liable to change. During high water the left bank is liable to overflow, but this condition would not likely hold for any extended period.

DISCHARGE MEASUREMENTS.

The discharge measurements at this point are made by wading.

ACCURACY.

For the range in stage covered by the discharge measurements the discharge curve is well defined.

Discharge Measurements of Clear Creek above Junction with Little Saskatchewan River, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec. ft.
May 10	E. B. Patterson....	1,920	7·5	3·0	0·85	....	2·6
May 19	"	1,920	12·0	8·8	0·46	93·07	4·0
May 31...	"	1,920	12·6	10·4	0·63	93·22	6·5
June 2	"	1,920	12·6	10·4	0·56	93·20	5·8
June 5.	"	1,920	12·8	10·9	0·63	93·23	6·8
June 15..	"	1,920	12·5	9·4	0·43	93·11	4·0
July 24..	G. K. Gainsford....	1,435	11·5	15·2	0·37	93·13	5·6
Aug. 24..	H. H. Pratt........	1,496	12·2	12·3	0·23	93·14	2·9
Sept. 25.	G. K. Gainsford....	1,196	14·0	18·2	1·08	93·77	19·7
Nov. 6..	"	1,196	14·0	15·6	0·98	93·54	15·3

DAILY GAUGE HEIGHT AND DISCHARGE OF CLEAR CREEK AT JUNCTION WITH LITTLE SASKATCHEWAN RIVER FOR 1915.

[Drainage area 95 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet	Sec. ft.
1												
2											93·20	6
3												
4												
5											93·23	7
6												
7											93·22	6
8												
9											93·22	6
10												
11											93·12	4
12												
13												
14											93·07	4
15											93·11	4
16											93·12	4
17												
18											93·12	4
19									93·07	4		
20												
21											93·25	7
22												
23											93·15	5
24												
25											93·22	6
26												
27												
28											93·47	13
29												
30											93·22	6
31									93·22	6		

Day.	July.		August.		September.		October.		November.		December.	
1					93·07	4	93·77	20	93·62	16	94·17	
2	93·17	5	93·14	5								
3					93·09	4			93·59	16	94·12	
4			93·12	4			93·72	19				
5	93·22	6							93·59	16		
6			93·12	4	93·12	4	93·72	19	93·54	14	94·27	
7	93·12	4										
8			93·07	4	93·22	6	93·72	19	93·54	14	94·27	
9	93·12	4										
10					93·29	8			93·39	11	94·14	
11			93·02	3			93·64	17				
12	93·27	8							94·04	27		
13			93·05	3	93·62	16	93·57	15			93·87	
14	93·12	4										
15					93·72	19	93·64	17	94·27	33	94·07	
16	93·34	10	93·05	3								
17					93·79	21			93·92		94·14	
18			93·07	4			93·62	16				
19	93·32	9							93·89			
20			93·12	4	93·82	22	93·62	16			94·07	
21	93·22	6										
22					93·71	19	93·62	16	93·99		94·12	
23	93·27	8	93·19	6								
24	93·13	5	93·14	5	93·71	19			94·02		94·32	
25			93·05	3	93·77	20	93·67	18				
26	93·12	4							93·82			
27			93·02	3	93·72	19	93·69	18			94·32	
28	93·12	4										
29					93·74	19	93·69	18	93·97		94·17	
30	93·12	4	93·07	4								
31											94·32	

MONTHLY DISCHARGE OF CLEAR CREEK AT JUNCTION WITH LITTLE SASKATCHEWAN RIVER FOR 1915.

[Drainage area 95 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches of Drainage Area.	Total in acre-feet.
May	....	....	[1]5	0·053	0·061	307
June	13	4	6	0·063	0·070	357
July	10	4	6	0·063	0·073	369
August	6	3	4	0·042	0·048	246
September	22	4	14	0·147	0·164	833
October	20	15	18	0·189	0·218	1,107
November	33	....	[1]12	0·126	0·141	714
The Period	33	4	9	0·098	0·775	3,933

NOTE.—Marked thus (1) estimated.

LITTLE SASKATCHEWAN RIVER AT BEILBY'S BRIDGE.

HISTORY.

The station on the Little Saskatchewan was established on March 18, 1914, by W. J. Ireland, under ice cover conditions. It was found when the ice went out that the location was unsatisfactory on account of eddies on the section, and a cable carrier station was established downstream from the bridge. This station has been in continuous operation since that time.

LOCATION OF SECTION.

The meter section is located four hundred feet downstream from Beilby's traffic bridge. It is twelve miles northwest of Minnedosa, five miles west of Clan William and one and one-half mile downstream from the junction of the Little Saskatchewan and Rolling rivers.

RECORDS AVAILABLE.

Records of daily gauge height have been secured from April 25, 1914. Sufficient meterings have been made to define a curve and estimate daily discharges during the open water season from April 25 to November 29, 1914, and from April 12 to November 11, 1915. During the closed water season of 1915 sufficient infomartion was not obtained for computing daily discharges.

DRAINAGE AREA.

The area tributary to the Little Saskatchewan above Beilby's bridge is 1,120 square miles.

GAUGE.

A nine-foot vertical staff gauge is secured to a pile, sixty-four feet from the north end of the bridge on the downstream side. It is referred to a permanent M.H.S. B.M., located seventy-three feet north of the north end of the bridge. This B.M. is set to an arbitrary datum.

CHANNEL.

For five hundred feet above the section and three hundred feet below, the channel is straight. At all stages the river is confined to one channel, the bed of the stream is of sand and gravel and fairly permanent, the banks are low and subject to overflow at extreme stages.

DISCHARGE MEASUREMENTS.

Discharge measurements are made by means of a cable carrier, which travels on a cable which is stretched across the river at the section. The measurements cover a range in stage of 2·5 feet.

ACCURACY.

The discharge measurements taken do not define the discharge curve very well, due to difficulty in obtaining accurate soundings at the section.

Discharge Measurements of Little Saskatchewan River at Beilby's Bridge, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec. ft.
Jan. 1	C. O. Allen......	1,912	60·0	48·0	....	94·99	..........[1]
Jan. 23	M. S. Madden......	1,462	37·0	20·6	0·02	93·89	0·5[2]
Mar. 20	"	1,462	25·0	7·6	0·12	93·98	0·9[2]
April 15	C. O. Allen......	1,912	75·5	190·3	0·87	94·69	166·5
April 25	"	1,912	74·2	160·4	0·57	94·24	91·6
May 14	"	2,018	74·0	129·0	0·37	93·89	47·7
May 20	E. B. Patterson....	1,920	74·0	134·8	0·50	93·97	67·1
June 5	C. O. Allen......	2,018	74·0	117·9	0·31	93·68	36·5
June 11	E. B. Patterson....	1,920	76·0	152·9	0·62	94·19	95·3
June 23	"	1,920	76·0	151·4	0·58	94·15	87·5
July 20	G. K. Gainsford....	1,435	77·0	172·3	0·62	94·43	106·3
Aug. 19	H. H. Pratt........	1,496	74·0	91·4	0·11	93·75	9·8
Sept. 23	G. K. Gainsford ...	1,196	76·0	133·0	0·41	94·08	54·5
Oct. 29	C. O. Allen........	1,374	76·0	148·0	0·57	94·09	84·4

[1] No flow. Water flooding ice.

[2] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF LITTLE SASKATCHEWAN RIVER AT BEILBY'S BRIDGE FOR 1915.

[Drainage area 1,120 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-chargc.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	94·99	0	94·62	...	...	...	...	...	94·07	75	93·73	37
2	94·97	...	...	...	95·13	...	...	...	94·05	73	93·72	36
3	...	...	...	...	...	...	95·78	...	94·02	69	93·72	36
4	...	...	...	...	...	...	95·76	...	93·99	66	93·72	36
5	...	...	94·87	...	...	...	95·74	...	94·97	64	93·75	40
6	...	...	...	...	94·93	...	95·73	...	94·95	62	93·77	42
7	94·77	...	...	...	...	...	95·55	...	94·91	57	93·79	44
8	...	...	...	...	...	...	95·48	...	94·87	53	93·97	64
9	...	...	95·05	...	94·75	...	95·32	...	94·82	47	94·17	87
10	...	...	...	...	...	...	95·28	...	94·84	49	94·18	88
11	94·42	...	...	...	...	...	95·25	...	94·85	51	94·19	90
12	...	...	...	...	...	...	95·17	250	94·87	53	94·22	94
13	...	...	95·07	...	94·53	...	94·89	194	94·89	55	94·22	94
14	...	...	...	...	...	...	94·74	167	94·89	55	94·19	90
15	94·02	...	...	...	...	...	94·69	160	94·96	63	94·12	81
16	...	...	95·21	...	94·33	...	94·67	157	94·94	·60	94·19	90
17	...	...	...	...	...	...	94·67	157	94·99	66	94·19	90
18	...	...	...	...	...	...	94·63	151	94·05	73	94·17	87
19	93·87	...	95·29	...	...	...	94·61	148	94·01	68	94·17	87
20	...	...	...	...	93·98	1	94·47	128	93·97	64	94·19	90
21	...	...	...	...	...	...	94·45	125	93·95	62	94·17	87
22	...	...	...	...	...	...	94·39	117	93·91	57	94·15	84
23	93·89	1	95·37	...	95·93	...	94·32	107	93·89	55	94·17	87
24	...	...	...	...	...	...	94·29	103	93·87	53	94·19	90
25	...	...	...	...	...	...	94·27	100	93·85	51	94·21	92
26	94·02	...	95·19	...	...	...	94·22	94	93·81	46	94·22	94
27	...	...	...	...	95·95	...	94·17	87	93·77	42	94·25	97
28	...	...	...	...	...	...	94·15	85	93·76	41	94·29	103
29	...	...	...	...	...	...	94·12	81	93·75	40	94·32	107
30	94·27	...	...	...	95·73	...	94·09	77	93·74	38	94·27	100
31	...	...	...	...	...	...	...	...	93·73	37	...	

Day.	July.		August.		September.		October.		November.		December.	
1	94·17	87	93·97	64	93·75	40	94·09	77	94·15	85	...	
2	94·15	84	93·97	64	93·74	38	94·12	81	94·13	82		
3	94·11	79	93·95	62	93·73	37	94·13	82	94·11	79		
4	94·09	77	93·95	62	93·72	36	94·14	83	94·09	77	94·37	
5	94·07	75	93·95	62	93·72	36	94·15	85	94·07	75		
6	94·05	73	93·93	59	93·72	36	94·17	87	94·05	73		
7	94·03	70	93·92	58	93·72	36	94·19	90	94·05	73	94·39	
8	93·99	66	93·91	57	93·72	36	94·22	94	94·06	74		
9	93·95	62	93·89	55	93·72	36	94·22	94	94·07	75		
10	93·92	58	93·87	53	93·72	36	94·52	135	94·07	75		
11	93·91	57	93·87	53	93·77	42	94·52	135	94·09	77	94·42	
12	93·89	55	93·87	53	93·79	44	94·42	121	94·10			
13	93·87	53	93·85	51	93·82	47	94·37	114	94·11			
14	93·87	53	93·77	42	93·83	48	94·32	107	94·12			
15	93·97	64	93·77	42	93·87	53	94·22	94				
16	94·17	87	93·76	41	93·92	58	94·17	87				
17	94·22	94	93·75	40	93·95	62	94·16	86	94·15			
18	94·32	107	93·75	40	93·95	62	94·15	85			94·47	
19	94·37	114	93·75	40	93·95	62	94·13	82				
20	94·42	121	93·75	40	93·97	64	94·11	79	94·19			
21	94·39	117	93·75	40	93·97	64	94·07	75			94·45	
22	94·37	114	93·75	40	93·99	66	94·05	73				
23	94·32	107	93·75	40	94·02	69	94·03	70	94·22			
24	94·27	100	93·75	40	94·05	73	94·02	69				
25	94·17	87	93·75	40	94·07	75	94·05	73			94·44	
26	94·07	75	93·75	40	94·07	75	94·07	75				
27	94·12	81	93·75	40	94·05	73	94·09	77	94·25		94·41	
28	94·07	75	93·75	40	94·05	73	94·11	79				
29	94·02	69	93·75	40	94·07	75	94·13	82				
30	93·98	65	93·75	40	94·09	77	94·15	85	94·29			
31	93·97	64	93·75	40			94·16	86			94·39	

NOTE—Ice conditions from January 1 to April 11, and November 12 to December 31
Information insufficient to compute daily discharges

MONTHLY DISCHARGE OF LITTLE SASKATCHEWAN RIVER AT BEILBY'S BRIDGE FOR THE YEAR 1915.

[Drainage area 1,120 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet
January	....	....	0	0.000	0.000	0
February	....	....	[1]0	0.000	0.000	0
March	....	....	[1]2	0·002	0·002	120
April	250	....	[1]95	0·085	0·095	5,600
May	75	37	56	0·050	0·058	3,450
June	107	36	78	0·070	0·078	4,650
July	121	53	80	0·071	0·082	4,925
August	64	40	48	0·043	0·050	2,950
September	77	36	54	0·048	0·054	3,225
October	135	69	88	0·079	0·091	5,400
November	85	....	[1]40	0·036	0·040	2,380
December	....	....	[1]8	0·007	0·008	492
The Year	250	....	46	0·041	0·558	33,192

NOTE.—Marked thus (1) estimated.

LITTLE SASKATCHEWAN RIVER AT MINNEDOSA.

HISTORY.

A station was first established on the Little Saskatchewan at Minnedosa in October, 1912, by W. G. Worden at the highway bridge within the town. This was abandoned and later one was established by C. O. Allen at the power house on July 13, 1914. This station is still in operation.

LOCATION OF SECTION.

The meter section is located on the upstream side of the traffic bridge crossing the Minnedosa Power Company's intake, and about three-quarters of a mile from the C.P.R. station.

RECORDS AVAILABLE.

A gauge height record was kept at the old station on the highway bridge from October 14 to November 2, 1912. A record of daily gauge height has been kept at the head and tailwater of the Minnedosa Power Company from June 2, 1914, to the end of the year 1915.

DRAINAGE AREA.

The drainage area above Minnedosa is 1,200 square miles. The area is not significant in this case, as the station is only used to determine the discharge through the power plant.

GAUGE.

The gauge in the headrace is a six-foot vertical staff enamelled gauge fastened to the intake wall of the power plant on the left hand side. The tailrace gauge is a six-foot vertical staff enamelled gauge fastened to the side of the retaining wall in the tailrace on the right hand side.

CHANNEL.

The channel at the meter section is that formed by the intake for the power plant.

DISCHARGE MEASUREMENTS.

Measurements are taken from the bridge across the intake.

ACCURACY.

Owing to the fact that the discharge is controlled entirely by the operation of the power station and quite irrespective of gauge heights, no discharge curve has been constructed.

Discharge Measurements of Little Saskatchewan Intake at Minnedosa Power House, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
April 15...	C. O. Allen........	1,912	19·5	168·5	0·55	1,647·72	92·9
May 14...	"	2,018	19·5	252·0	0·39	1,652·12	98·3
June 5...	"	2,018	19·6	239·8	0·39	1,651·22	93·5
23...	E. B. Patterson....	1,920	19·5	268·7	0·36	1,653·14	96·7
July 20...	G. K. Gainsford...	1,435	19·0	279·5	0·29	1,653·32	82·5
Aug. 18...	H. H. Pratt........	1,496	19·5	213·4	0·33	1,651·64	69·3
Oct. 29...	C. O. Allen........	1,374	19·6	271·6	0·33	1,652·91	89·6

ROLLING RIVER (ERICKSON'S BRIDGE).

HISTORY.

A metering station was established on the Rolling river at Erickson's bridge on May 4, 1915, but it was only operated for a short time, owing to interference with the control points on the stream in this locality through the workings of beavers above and below the section.

LOCATION OF SECTION.

The section is located thirty feet downstream from Erickson's bridge on the E. boundary, Sec. 21, Tp. 18, R. 18, W.P.M. The Initial Point is painted on a fence post on the right bank.

RECORDS AVAILABLE.

From May 3 to June 22, 1915, records of gauge height and estimated daily discharges are available, also miscellaneous discharge measurements taken through the summer of the same year.

DRAINAGE AREA.

The drainage area tributary to the river at this point is 112 square miles.

Taken by E. B. Patterson.

LITTLE SASKATCHEWAN DRAINAGE AREA—ROLLING RIVER METER SECTION AT ERICKSON'S BRIDGE.

GAUGE.

A six-foot vertical staff gauge is secured to a pile on the downstream side of the bridge above the section. This gauge is referred to a B.M. set to an arbitrary datum and located twenty yards northwest of bridge. The B.M. is a notch cut in the root of a spruce tree.

CHANNEL.

The channel at the section is straight for a short distance above and below. The bed of the stream is of a gravelly nature. The left bank is liable to overflow in times of high water.

DISCHARGE MEASUREMENTS.

All discharge measurements are taken by wading.

ACCURACY.

On account of the variable control which led to the abandonment of the station, the accuracy is not high.

DISCHARGE MEASUREMENTS OF ROLLING RIVER AT ERICKSON'S BRIDGE, DANVERS, 1915.

Date	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec	Feet.	Sec. ft.
May 4	E. B. Patterson.	1,920	22	29·0	0·39	92·79	11·3
6	"	1,920	22	26·9	0·31	92·74	8·2
13	"	1,920	23	37·4	0·80	93·18	29·8
21	"	1,920	22	27·9	0·40	92·81	11·1
June 10	"	1,920	24	34·2	0·72	93·12	24·6
22.	"	1,920	24	36·4	0·73	93·19	26·7
July 21	G. K. Gainsford	1,435	22	29·9	0·57	93·00	17·0
Sept. 24	"	1,196	23	25·2	0·16	92·67	4·0

Daily Gauge Height and Discharge of Rolling River at Erickson's Bridge, Danvers, for 1915.

[Drainage area 112 square miles.]

Day.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet	Sec. ft.
1			92·56	1								
2			92·56	1								
3			92·49	0								
4	92·79	11	92·39	0								
5	[1]92·76	9	92·56	1								
6	92·74	8	92·66	5								
7	92·74	8	92·86	14								
8	92·74	8	92·96	18								
9	92·74	8	93·06	23								
10	92·86	14	93·16	27								
11	92·76	9	93·66	50								
12	92·86	14	93·45	40								
13	93·16	27	93·06	24								
14	93·06	23	93·16	27								
15	93·16	27	93·26	32								
16	93·06	23	93·66	50								
17	93·06	23	93·66	50								
18	92·96	18	93·16	27								
19	92·73	8	93·16	27								
20	92·86	14	92·75	9								
21	92·81	11	93·06	23	93·00	20						
22	92·76	9	93·19	29								
23	92·66	5										
24	92·66	5							92·67	5		
25	92·66	5										
26	92·66	5										
27	92·66	5										
28	92·66	5										
29	92·56	1										
30	92·56	1										
31	92·56	1										

Note—Marked thus([1]) interpolated.

Monthly Discharge of Rolling River at Erickson's Bridge, Danvers, for 1915.

[Drainage area 112 square miles.]

MONTH.	Discharge in Second-Feet				Run-Off	
	Maximum.	Minimum.	Mean	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
May			[1]10	0·089	0·103	615
June	50	0	[1]23	0·205	0·229	1,370
July			[1]15	0·134	0·155	922
August			[1]10	0·089	0·103	615
September			[1]9	0·080	0·089	536
October			[1]10	0·089	0·103	615
November			[1]11	0·098	0·109	655
December						
The Period			13	0·112	0·891	5,328

Note.—Marked thus ([1]) estimated.

ROLLING RIVER NEAR C.N.R. CROSSING.

HISTORY.

A metering station was established on the Rolling river at Lee's bridge on June 22, 1915, and was in operation throughout the open water season of that year.

LOCATION OF SECTION.

The section is located on the downstream side of Lee's bridge, three and one-half miles from Erickson and one-half mile north of C.N.R. The bridge is in Sec. 7, Tp. 18, R. 18, W.P.M. The Initial Point is painted on the downstream hand rail at the east end of the bridge.

RECORDS AVAILABLE.

From the date of the establishment of the station, June 22, 1915, to November 12 daily gauge heights and estimated discharges have been obtained. After the latter date ice cover conditions prevailed and the information obtained was not sufficient to allow the estimating of daily discharges. Discharge measurements covering a range of two feet were obtained.

DRAINAGE AREA.

The drainage area tributary to the river at this point is 235 square miles.

GAUGE.

A six-foot vertical staff gauge is secured to the center pile on the dowstream side of the bridge. This gauge is referred to a B.M. set to an arbitrary datum located on the root of a spruce tree one hundred and fifty feet east of the bridge.

CHANNEL.

The section is located in a slightly curved stretch of the river. The banks are high but at extreme high water the right bank is liable to overflow. The bed of the stream is silt and is liable to shift in high water.

DISCHARGE MEASUREMENTS.

Discharge measurements are made from the bridge at all stages of the river.

ACCURACY.

The discharge curve for the range in stage covered by the discharge measurements is fairly well defined.

Discharge Measurements of Rolling River near C.N.R. Crossing, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
June 22.	E. B. Patterson....	1,920	38	77·7	0·73	89·70	56·4
July 21..	G. K. Gainsford...	1,435	37	81·2	0·53	89·79	43·3
Aug. 20..	H. H. Pratt.......	1,496	34	18·4	0·10	87·79	2·5
Sept. 24..	G. K. Gainsford...	1,196	36	55·9	0·31	89·14	17·3
Nov. 4 .	"	1,196	36	52·8	0·34	89·01	18·0

DAILY GAUGE HEIGHT AND DISCHARGE OF ROLLING RIVER NEAR C.N.R. CROSSING FOR 1915.

[Drainage area 235 square miles.]

Day.	June.		July.		August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	....	....	89·60	35	88·97	16	88·40	7	89·35	26	89·18	21
2	....	....	89·47	30	89·03	17	88·40	7	89·45	29	89·16	21
3	....	....	89·42	28	89·25	23	88·40	7	89·52	33	89·11	19
4	....	....	89·32	25	89·22	23	88·40	7	89·60	35	89·07	18
5	....	....	89·32	25	89·18	21	88·50	9	89·64	37	89·01	17
6	....	....	89·31	25	89·11	19	88·72	12	89·69	39	89·04	18
7	....	....	89·27	23	89·03	17	88·80	13	89·82	44	89·07	18
8	....	....	89·12	20	88·91	15	88·72	12	90·25	63	89·10	19
9	....	....	89·14	20	88·85	14	88·78	13	90·61	82	89·13	20
10	....	....	89·00	17	88·82	13	88·92	15	90·67	85	89·18	21
11	....	....	89·15	20	88·84	14	88·98	16	90·67	85	89·21	22
12	....	....	89·20	22	88·86	14	88·90	15	90·38	69	89·27	23
13	....	....	89·42	28	88·70	11	88·90	15	90·15	58	....	....
14	....	....	89·35	26	88·75	12	88·92	15	89·95	50	....	....
15	....	....	89·35	26	88·70	11	89·02	17	89·75	41	....	....
16	....	....	89·37	27	88·70	11	89·09	19	89·57	34	....	....
17	....	....	89·55	33	88·70	11	89·10	19	89·37	27	....	....
18	....	....	89·82	44	88·70	11	89·02	17	89·27	23	....	....
19	....	....	89·87	40	88·69	11	89·00	17	89·23	22	....	....
20	....	....	89·83	44	88·63	10	89·00	17	89·16	21	....	....
21	....	....	89·82	44	88·60	10	89·05	18	89·10	19	....	....
22	89·73	40	89·68	38	88·60	10	89·30	24	89·09	19	....	....
23	89·72	40	89·58	34	88·60	10	89·24	23	89·08	18	....	....
24	89·67	38	89·50	31	88·60	10	89·19	21	89·11	19	....	....
25	89·74	41	89·37	27	88·60	10	89·15	20	89·13	20	....	....
26	89·88	47	89·27	23	88·58	10	89·10	19	89·14	20	....	....
27	89·93	49	89·17	21	88·54	9	89·07	18	89·16	21	....	....
28	90·00	52	89·10	19	88·51	9	89·02	17	89·17	21	....	....
29	89·85	45	89·02	17	88·50	9	89·07	18	89·18	21	....	....
30	89·70	39	89·01	17	88·47	8	89·17	21	89·19	21	....	....
31	....	....	88·90	15	88·40	7	....	....	89·19	21	....	....

NOTE.—Ice conditions from November 13 to December 31.
Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF ROLLING RIVER AT C.N.R. CROSSING FOR THE PERIOD JUNE—NOVEMBER, 1915.

[Drainage area 235 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
May	....	......	[1]16	0·068	0·078	984
June	....	......	[1]40	0·170	0·190	2,375
July	46	15	27	0·114	0·131	1,660
August	23	7	13	0·055	0·063	799
September	24	7	16	0·068	0·076	952
October	85	18	36	0·153	0·176	2,210
November	...	...	[1]16	0·068	0·076	952
The Period	85	7	25	0·099	0·790	9,932

NOTE.—Marked thus (1) estimated.

WHIRLPOOL RIVER AT DANVERS.

HISTORY.

A metering station was established on the Whirlpool river at Danvers on May 6, 1915, by E. B. Patterson, and throughout the open water season of that year the station was in operation.

LOCATION OF SECTION.

The section is located on the downstream side of what is locally known as Erickson's bridge, one-half mile from Danvers P.O., on the north boundary of Sec. 21, Tp. 18, R. 18, W.P.M. The Initial Point is indicated by a painted I.P. on a pile at east side of section.

RECORDS AVAILABLE.

From the date of the establishment of the station, May 6, 1915, to November 11 of that year, daily gauge heights with estimated daily discharges are available. Discharge measurements covering a range in stage of one and a half feet have been obtained.

DRAINAGE AREA.

The drainage area tributary to the Whirlpool river above the metering section is 79 square miles.

GAUGE.

A six-foot staff gauge is secured to a pile on the downstream side of the bridge. This gauge is referred to a B.M. set to an arbitrary datum on the root of a dry spruce tree on the south side of the road, four hundred feet east of the bridge.

CHANNEL.

The banks in the vicinity of the station are low and in high water will overflow. The bed of the stream is sandy and liable to shift.

DISCHARGE MEASUREMENTS.

The discharge measurements are taken by wading, except during high stages of the river, when they are taken from the bridge.

ACCURACY.

Throughout the range of stage covered by the discharge measurements obtained the discharge curve is well defined.

Discharge Measurements of Whirlpool River at Danvers, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet	Sec. ft.
May 6	E. B. Patterson	1,920	10·0	6·5	0·56	87·27	3·6
May 13	"	1,920	10·5	7·3	0·66	87·28	4·8
May 21	"	1,920	12·0	9·6	0·61	87·55	6·7
June 10	"	1,920	12·0	8·8	0·61	87·52	5·4
June 22	"	1,920	19·0	25·7	0·71	88·29	18·2
July 21	G. K. Gainsford	1,435	18·5	21·2	0·67	88·23	14·3
Aug. 20	H. H. Pratt.	1,196	12·6	7·8	0·18	86·87	1·4
Sept. 21	G. K. Gainsford	1,196	17·5	15·7	0·44	87·76	6·9
Nov. 1	"	1,196	19·0	21·0	0·34	87·66	7·1

DAILY GAUGE HEIGHT AND DISCHARGE OF WHIRLPOOL RIVER AT DANVERS FOR 1915.

[Drainage area 79 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2
6	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	87·17	3
7	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	87·27	4
8	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	87·37	4
9	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	87·79	9
10	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	87·57	6
11	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	87·47	5
12	.....	.....	.....	.....	.....	.....	.....	.....	87·67	7	87·37	4
13	.....	.....	.....	.....	.....	.....	.....	.....	87·87	10	87·27	4
14	.....	.....	.....	.....	.....	.....	.....	.....	87·87	10	88·07	14
15	.....	.....	.....	.....	.....	.....	.....	.....	87·87	10	88·87	29
16	.....	.....	.....	.....	.....	.....	.....	.....	87·87	10	88·82	28
17	.....	.....	.....	.....	.....	.....	.....	.....	87·97	12	88·82	28
18	.....	.....	.....	.....	.....	.....	.....	.....	87·83	10	88·77	27
19	.....	.....	.....	.....	.....	.....	.....	.....	87·67	7	88.67	25
20	.....	.....	.....	.....	.....	.....	.....	.....	87·67	7	88·57	23
21	.....	.....	.....	.....	.....	.....	.....	.....	87·56	6	88·57	23
22	.....	.....	.....	.....	.....	.....	.....	.....	87·37	4	88·29	18
23	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	88·37	19
24	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	88·37	19
25	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	88·57	23
26	.....	.....	.....	.....	.....	.....	.....	.....	87.27	4	88·67	25
27	.....	.....	.....	.....	.....	.....	.....	.....	87·27	4	88·83	29
28	.....	.....	.....	.....	.....	.....	.....	.....	87·17	3	88·80	28
29	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2	88·79	28
30	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2	88·57	23
31	.....	.....	.....	.....	.....	.....	.....	.....	87·07	2	.....	.....

Day.	July.		August.		September.		October.		November.		December.	
1	88·27	17	87·57	6	86·87	1	88·17	15	87·77	9		
2	88·17	15	87·67	7	86·87	1	88·17	15	87·77	9		
3	88·17	15	87·57	6	86·87	1	88·37	19	87·81	9		
4	88·07	14	87·47	5	86·87	1	88·27	17	87·67	7		
5	87·97	12	87·17	3	86·87	1	88·17	15	87·67	7		
6	87·87	10	87·07	2	86·87	1	88·17	15	87·67	7		
7	87·77	9	87·07	2	86·97	2	89·77	51	87·67	7		
8	87·57	6	87·07	2	87·78	9	90·80	80	87·67	7		
9	87·79	9	87·07	2	87·47	5	90·87	82	87·67	7		
10	87·47	5	87·07	2	87·47	5	90·81	80	87·67	7		
11	87·57	6	86·97	2	87·47	5	90·27	65	87·67	7		
12	87·77	9	86·97	2	87·37	4	89·47	43				
13	87·81	9	86·97	2	87·37	1	89·27	38				
14	87·57	6	86·97	2	87·37	4	88·87	29				
15	87·67	7	86·97	2	87·80	9	88·47	21				
16	87·97	11	86·97	2	87·67	7	88·17	15				
17	88·27	17	86·63	1	87·67	7	87·87	10				
18	88·37	19	86·83	1	87·80	9	87·77	9				
19	88·27	17	86·87	1	87·79	9	87·67	7				
20	87·86	10	86·87	1	87·57	6	87·67	7				
21	87·86	10	86·97	2	87·67	7	87·67	7				
22	88·07	14	86·97	2	87·51	6	87·67	7				
23	87·87	10	86·97	2	87·67	7	87·67	7				
24	87·57	6	86·97	2	87·67	7	87·67	7				
25	87·47	5	86·97	2	87·77	9	87·67	7				
26	87·78	9	86·97	2	87·77	9	87·81	9				
27	87·37	1	86·83	1	87·82	9	87·87	10				
28	87·77	9	86·87	1	87·87	10	87·77	9				
29	87·27	4	86·87	1	87·97	12	87·81	9				
30	86·86	1	86·87	1	88·07	14	87·67	7				
31	87·17	3	86·87	1			87·67	7				

MONTHLY DISCHARGE OF WHIRLPOOL RIVER AT DANVERS, FOR 1915.

[Drainage Area 79 square miles.]

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
May	....	....	[1]5	0·063	0·073	307
June	29	2	15	0·190	0·212	893
July	19	1	10	0·127	0·146	615
August	7	1	2	0·025	0·029	123
September	14	1	6	0·076	0·085	357
October	82	7	23	0·291	0·336	1,410
November	....	....	[1]4	0·051	0·057	238
December	....	....	....	....	....	....
The Period	....	....	9	0·118	0·938	3,943

NOTE.—Marked thus ([1]) estimated.

SOURIS RIVER.

The source of the Souris river is in the province of Saskatchewan, northwest of the town of Weyburn. The course of the river from its source is generally southeast crossing the International boundary into the State of North Dakota in Tp. 1, R. 34 West Principal Meridian. After crossing the boundary it bends northeast re-crossing the International boundary to the east of the boundary between Saskatchewan and Manitoba and flowing in a general northeastern direction to its junction with the Assiniboine river near the city of Brandon.

The drainage area of the Souris (22,860 square miles) is very large when compared with the discharge as will be noted by reference to the following tables.

The area drained is largely settled and under cultivation, the soil being of a gravelly nature lightly overlaid by an alluvial deposit. The land is largely open prairie and very little timber is to be found.

The upper part of the river valley is not deep but as the mouth is approached the depth is increased until banks of from 150 to 200 feet are encountered.

The district drained is about the most closely settled in the province and the question of water supply for various purposes renders the gathering of discharge data important.

SOURIS RIVER AT MELITA.

HISTORY.

A metering station was established on the Souris river at Melita on April 23rd and from that date observations have been made at the station.

LOCATION OF SECTION.

The station is located on the downstream side of the traffic bridge in River park in the town of Melita. The Initial Point is painted on the side of the railing at the west end of the bridge.

RECORDS AVAILABLE.

From the date of the establishment of the station to the end of the year 1915 daily gauge records have been obtained. Discharge measurements have been made at various stages of the river covering practically the entire range during the period, and estimates of daily discharge are available for the period from April 23 to November 13. From this latter date to the end of the year ice cover conditions prevailed and the information obtained was not sufficient to allow the estimating of daily discharges.

DRAINAGE AREA.

The drainage area tributary to the river at this metering station is 10,673 square miles.

GAUGE.

A six-foot vertical staff gauge has been secured to the centre pier at the east end of the bridge close to the water's edge on the right bank. The gauge is referred to a permanent M.H.S. B.M. located fifty-seven feet southeast from the southeast corner of the bridge. This B.M. is set to an assumed datum.

CHANNEL.

The channel is straight for a distance of three hundred feet above the section and one hundred and fifty feet below. The banks are high and not liable to overflow. The bed is composed of sandy gravel and under ordinary conditions not liable to shift.

DISCHARGE MEASUREMENTS.

Discharge measurements are made from the bridge during all stages of the river.

ACCURACY.

The discharge curve throughout the range of stage met with since the establishment of the station is fairly well defined.

DISCHARGE MEASUREMENTS OF SOURIS RIVER AT MELITA, FOR 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height	Discharge.
			Feet	Sq. ft.	Ft. per sec	Feet	Sec. ft.
April 23...	M. S. Madden	1,462	75	119·4	0·25	87·80	30·2
May 28...	C. O. Allen	2,018	83	167·4	0·56	88·25	93·7
Aug. 4.	T. H. Boyd	1,197	72	69·8	0·03	87·09	1·9
Aug. 31.	"	1,197	72	77·8	......	87·19	[1]
Oct. 22.	C. O. Allen	1,374	76	93·0	0·20	87·31	18·6

[1] No discharge.

DAILY GAUGE HEIGHT AND DISCHARGE OF SOURIS RIVER AT MELITA, FOR 1915.

[Drainage area 10,673 square miles.]

Day	January.		February.		March.		April.		May.		June	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	...	...	...	...	...	...	...	...	87·93	66	87·18	9
2	...	...	...	...	...	...	...	...	87·83	58	87·18	9
3	...	...	...	...	...	...	...	...	87·98	70	87·08	2
4	...	...	...	...	...	...	...	...	87·85	59	87·13	5
5	...	...	...	...	...	...	...	...	87·78	54	87·18	9
6	...	...	...	...	...	...	...	...	87·67	45	87·05	1
7	...	...	...	...	...	...	...	...	87·58	38	86·97	...
8	...	...	...	...	...	...	...	...	87·63	42	86·93	...
9	...	...	...	...	...	...	...	...	87·88	62	86·95	...
10	...	...	...	...	...	...	...	...	88·05	76	87·00	...
11	...	...	...	...	...	...	...	...	88·17	86	87·03	1
12	...	...	...	...	...	...	...	...	87·63	42	87·08	2
13	...	...	...	...	...	...	...	...	87·75	52	86·95	...
14	...	...	...	...	...	...	...	...	88·08	78	87·08	2
15	...	...	...	...	...	...	...	...	88·38	105	87·13	5
16	...	...	...	...	...	...	...	...	87·88	62	87·08	2
17	...	...	...	...	...	...	...	...	88·33	100	87·27	[1] 15
18	...	...	...	...	...	...	...	...	88·38	105	89·23	[2] 181
19	...	...	...	...	...	...	...	...	88·31	98	89·18	177
20	...	...	...	...	...	...	...	...	88·21	89	88·75	138
21	...	...	...	...	...	...	...	...	88·23	91	88·21	89
22	...	...	...	...	...	...	...	...	88·08	78	87·95	68
23	...	...	...	...	...	...	87·78	51	88·18	87	87·89	63
24	...	...	...	...	...	...	87·85	60	88·21	89	88·18	87
25	...	...	...	...	...	...	87·88	62	88·33	100	87·86	60
26	...	...	...	...	...	...	88·17	86	88·32	99	87·89	63
27	...	...	...	...	...	...	88·35	102	88·34	101	87·98	70
28	...	...	...	...	...	...	87·85	60	88·30	98	87·73	50
29	...	...	...	...	...	...	87·73	50	87·76	52	87·55	36
30	...	...	...	...	...	...	87·88	62	87·35	21	87·38	23
31	...	...	...	...	...	...	...	...	87·25	14	...	...

	July.		August.		September.		October.		November.		December	
1	87·25	14	86·99	0	87·35	21	86·95	0	87·36	22	87·71	...
2	87·15	7	86·95	0	87·36	22	86·91	0	87·33	19	87·73	...
3	87·05	1	87·08	2	87·32	19	86·93	0	87·24	13	87·63	...
4	87·03	1	87·06	2	88·43	[2] 109	86·93	0	87·28	16	87·53	...
5	87·05	1	87·08	2	88·58	123	87·43	27	87·33	19	87·73	...
6	88·08	78	87·11	4	88·53	118	88·23	91	87·35	21	87·72	...
7	88·03	74	87·13	5	87·94	67	87·95	68	87·38	23	87·71	...
8	87·96	68	87·13	5	87·68	16	87·79	55	87·27	15	87·71	...
9	87·99	71	87·15	7	87·53	34	87·68	46	87·18	9	87·70	...
10	87·96	68	87·18	9	87·42	26	87·63	42	87·17	8	87·68	...
11	87·85	60	87·21	11	87·41	25	87·53	34	87·16	7	87·69	...
12	87·78	54	87·20	10	87·33	19	87·43	27	87·13	5	87·67	...
13	87·70	18	87·18	9	87·32	19	87·42	26	87·14	6	87·70	
14	87·63	12	87·22	11	87·27	15	87·36	22	87·28	...	87·72	...
15	87·45	28	87·28	16	87·16	7	87·35	21	87·21	...	87·69	
16	87·41	25	87·33	19	87·13	5	87·34	20	87·18	...	87·71	
17	87·35	21	87·25	14	87·08	2	87·32	19	87·26		87·70	
18	87·45	28	87·21	11	87·00	...	87·31	18	87·28		87·72	
19	87·41	25	87·23	12	87·01	...	87·28	16	87·26	...	87·73	
20	87·35	21	87·26	14	86·93	...	87·23	12	87·18		87·43	
21	87·32	19	87·25	14	86·91	...	87·26	14	87·19	...	87·42	...
22	87·25	14	87·23	12	86·89	...	87·30	17	87·21		87·40	
23	87·41	25	87·25	14	86·91	...	87·27	15	87·24	...	87·27	...
24	87·35	21	87·26	14	86·92	...	87·30	17	87·33	...	87·26	...
25	87·32	19	87·28	16	86·93	...	87·36	22	87·39	...	87·19	
26	87·21	11	87·20	10	86·95	...	87·28	16	87·13		87·05	
27	87·15	7	87·21	11	86·96	...	87·23	12	87·53		[1] 87·03	
28	87·08	2	87·28	16	86·97	...	87·26	14	87·63		[1] 87·00	...
29	87·06	1	87·23	12	86·96		87·32	19	87·68		[1] 86·95	
30	87·08	2	87·19	9	86·94		87·40	25	87·70		[1] 86·93	
31	87·03	1	87·18	9			87·38	23			[1] 86·93	

NOTE. Marked thus (1) interpolated.
(2) On June 18 and September 4 a dam above the section gave way.
Ice conditions November 14 to December 31.
Not sufficient information to compute daily discharges.

MONTHLY DISCHARGE OF SOURIS RIVER AT MELITA, FOR 1915.
[Drainage area, 10,673 square miles.]

MONTH	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
			[1]0	0.000	0.000	
January			[1]0	0.000	0.000	
February			[1]0	0.000	0.000	
March			[1]25	0·002	0·002	1,500
April	105	14	72	0·007	0·008	4,425
May	181	0	39	0·004	0·004	2,320
June	78	1	28	0·003	0·003	1,725
July	19	0	10	0·001	0·001	615
August	118	0	23	0·002	0·002	1,370
September	91	0	24	0·002	0·002	1,475
October			[1]7	0·001	0·001	416
November			[1]0	0	0	
December						
The Period			19	0·002	0·023	13,846

NOTE.—Marked thus ([1]) estimated.

SOURIS RIVER AT WAWANESA.

HISTORY.

The station on the Souris at Wawanesa was established on October 7, 1912, by W. G. Worden.

LOCATION OF SECTION.

The meter section is located on the downstream side of the traffic bridge across the Souris river one-quarter of a mile north of Wawanesa. The I.P. is an arrow carved and painted on the guard rail at the intersection of the girder and the guard rail on the downstream side of the bridge at the south end.

RECORDS AVAILABLE.

Daily gauge height records are available for the open water seasons over the period October 7, 1912, to the end of 1915. During the winter season the gauge heights were obtained at intervals of several days. Estimates of daily discharge have been prepared for the open water seasons during the period October 7, 1912, to the end of 1915. There was not sufficient information to estimate daily discharges during the winter season.

DRAINAGE AREA.

The drainage area of the Souris above Wawanesa is 22,500 square miles, part of which lies south of the International boundary.

GAUGE.

A vertical staff gauge is secured to the downstream side of the north pier of the bridge. This gauge is referred to a permanent M.H.S. B.M. located about seventy five feet southwest of I.P. The B.M. is set to an arbitrary datum.

CHANNEL.

For two hundred feet above the section and six hundred feet below, the channel is straight, the bed of the river is composed of sand and gravel and not liable to shift. The right bank of the stream is moderately high and not liable to overflow. The left bank is low, marshy and rather thickly wooded with small trees and scrub and is liable to overflow at high stages.

DISCHARGE MEASUREMENTS.

The meterings are taken from the downstream side of the bridge.

ACCURACY.

Between gauge height 100·7 and 102·0 the discharge curve is well defined. Between 102·0 and 104·5 the curve is fairly well defined. Beyond these limits the curve is not well defined.

Discharge Measurements of Souris River at Wawanesa, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 5...	C. O. Allen........	1,912	55	27	0·05	100·95	1·6[1]
Jan. 28...	M. S. Madden.....	1,462	13	2	....	100·90	[1]
Mar. 23...	"	1,462	62	14·9	0·46	101·35	6·8[1]
April 13...	C. O. Allen........	1,912	86	148·3	0·62	101·16	92·4
April 21...	M. S. Madden.....	1,462	86	152·0	0·68	101·24	103·1
April 22...	C. O. Allen........	1,912	86	156·3	0·70	101·24	109·3
May 8...	"	2,018	84	138·3	0·44	100·97	60·8
May 27...	"	2,018	86	146·0	0·51	101·07	74·5
Aug. 3...	T. H. Boyd........	1,197	81	106·5	0·16	100·72	17·0
Sept. 1..	"	1,197	74	76·7	0·00	100·43	00·0
Oct. 21...	C. O. Allen........	1,374	80	126·8	0·28	100·87	35·5

[1] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF SOURIS RIVER AT WAWANESA, FOR 1915.

[Drainage area 22,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	100·97	....	100·89	....	100·90	....	101·35	....	101·04	62	101·16	86
2	100·95	....	100·89	....	100·90	....	101·36	....	101·13	79	101·15	84
3	100·94	....	100·89	....	100·89	....	101·38	....	101·10	73	101·09	71
4	100·95	....	100·89	....	100·88	....	101·40	....	101·05	64	101·04	62
5	100·99	2	100·88	....	100·89	....	101·36	....	101·02	59	100·99	53
6	100·96	....	100·88	....	100·89	....	101·34	....	100·97	50	100·92	41
7	100·94	....	100·88	....	100·89	....	101·25	....	100·97	50	100·92	41
8	100·93	....	100·91	....	100·89	....	101·18	....	101·00	55	100·89	37
9	100·94	....	100·91	....	100·89	....	101·29	....	101·04	62	100·85	31
10	100·94	....	100·90	....	100·86	....	101·23	101	101·02	59	100·85	31
11	100·93	....	100·87	....	101·15	....	101·12	77	100·98	52	100·84	29
12	100·93	....	100·90	....	101·05	....	101·03	60	100·97	50	100·83	28
13	100·93	....	100·90	....	101·02	....	101·60	198	100·95	47	100·80	23
14	100·95	....	100·90	....	100·98	....	101·90	298	100·94	45	100·79	22
15	100·95	....	100·89	....	100·92	....	101·70	229	101·00	55	100·76	18
16	100·96	....	100·91	....	100·85	....	101·63	207	101·14	81	100·76	18
17	100·95	....	100·91	....	100·72	....	101·61	201	101·15	84	100·75	17
18	100·94	....	100·91[1]	....	100·63	....	101·62	204	101·12	77	100·73	15
19	100·94	....	100·90	....	100·64	....	101·50	167	101·11	75	100·72	13
20	100·94	....	100·91	....	100·81	....	101·40	140	101·13	79	100·72	13
21	100·94	....	100·92	....	100·90	....	101·24	98	101·12	77	100·71	12
22	100·93	....	100·91	....	100·94	....	101·24	98	101·07	68	100·70	11
23	100·93	....	100·91	....	101·35	7	101·31	118	101·14	81	101·30	116
24	100·92	....	100·91	....	101·25	....	101·25	105	101·16	86	101·29	114
25	100·91	....	100·90	....	101·27	....	101·21	96	101·15	84	101·28	112
26	100·89	....	100·89	....	101·26	....	101·25	105	101·15	84	101·27	109
27	100·93	....	100·92	....	101·23	....	101·23	101	101·06	66	101·16	86
28	100·90	0	100·90	....	101·43	....	101·13	79	101·05	64	101·11	75
29	100·91	....	....	....	101·33	....	101·09	71	101·08	69	101·08	69
30	100·89	....	....	....	101·32	....	101·05	64	101·11	75	101·01	57
31	100·87	....	....	....	101·34	....	....	....	101·12	77	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	100·99	53	100·79	22	100·45	0	100·78	21	100·82	26	100·96	....
2	101·04	62	100·78	21	100·43	0	100·94	45	100·83	28	101·02	....
3	101·03	60	100·77	19	100·44	0	[1]100·93	43	100·82	26	100·99	....
4	101·02	59	100·74	16	100·45	0	100·91	40	100·81	25	101·01	....
5	100·99	53	100·71	12	100·44	0	100·88	35	100·80	23	101·02	....
6	100·95	47	100·69	10	100·46	0	100·86	32	100·78	21	101·03	....
7	100·91	40	100·67	8	100·49	0	100·83	28	100·77	19	101·02	....
8	100·86	32	100·65	7	100·74	16	100·81	25	100·77	19	101·01	....
9	100·85	31	100·63	5	100·85[1]	31	100·78	21	100·76	18	101·01	....
10	100·85	31	100·62	4	100·91	40	[1]100·76	18	100·74	16	101·00	....
11	100·79	22	100·60	2	101·21	96	100·74	16	100·75	17	101·03	....
12	100·76	18	100·60	2	101·17	88	100·72	13	100·77	19	101·05	....
13	100·74	16	100·57	1	101·11	75	100·71	12	101·06	....	101·05	....
14	100·70	11	100·58	1	101·06	66	100·70	11	101·13	....	101·04	....
15	101·02	59	100·59	2	101·02	59	100·72	13	101·05	....	101·08	....
16	101·01	57	100·57	1	100·97	50	100·93	43	101·12	....	100·90	....
17	101·00	55	100·59	2	100·94	45	100·94	45	101·09	....	100·88	....
18	100·99	53	100·57	1	100·91	40	100·95	47	101·06	....	100·88	....
19	100·97	50	100·55	0	100·88	35	100·94	45	101·05	....	100·95	....
20	100·94	45	100·52	0	100·85	31	100·91	40	101·03	....	100·93	....
21	100·91	40	100·50	0	100·82	26	100·88	35	101·04	....	101·02	....
22	100·91	40	100·48	0	100·80	23	100·84	29	101·00	....	101·10	....
23	100·93	43	100·46	0	100·78	21	100·82	26	100·98	....	101·12	....
24	100·91	40	100·45	0	100·76	18	[1]100·90	38	100·96	....	[1]101·30	....
25	100·89	37	100·44	0	100·82	26	101·00	55	100·95	....	101·51	....
26	100·88	35	100·43	0	100·80[1]	23	101·01	57	100·94	....	101·05	....
27	100·87	34	100·42	0	100·80	23	100·98	52	100·95	....	101·02	....
28	100·86	32	100·44	0	100·79	22	100·94	45	100·98	....	101·02	....
29	100·86	32	100·47	0	100·78	21	100·91	40	100·90	....	100·99	....
30	100·81	25	100·48	0	100·79	22	100·90	38	100·93	....	100·98	....
31	100·79	22	100·47	0	....	......	100·86	32	......	....	101·03	....

NOTE.—All gauge heights marked thus (1) interpolated.
Ice conditions from January 1 to April 9 and November 13 to December 31.
Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF SOURIS RIVER AT WAWANESA FOR THE YEAR 1915.

[Drainage area 22,500 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January			[1]0	0	0	0
February			[1]0	0	0	0
March			[1]2	0	0	123
April			[1]95	0·004	0·004	5,650
May	86	45	67	0·003	0·003	4,125
June	116	11	50	0·002	0·002	2,975
July	62	11	40	0·002	0·002	2,460
August	22	0	4	0·000	0·000	246
September	96	0	30	0·001	0·001	1,790
October	57	11	34	0·002	0·002	2,090
November			[1]8	0·000	0·000	476
December			[1]2	0·000	0·000	123
The Year.	116	0	28	0·001	0·014	20,058

NOTE.—All marked thus (1) estimated

TRIBUTARIES OF LAKE WINNIPEGOSIS.

GENERAL.

Practically all of the drainage west of lake Manitoba and between the Riding mountains and the Saskatchewan river drains directly or indirectly into lake Winnipegosis.

Three small lakes act as intermediate basins and to these the greater part of the drainage first finds its way, being drained from them into lake Winnipegosis. These lakes are:—

Red Deer lake, into which Red Deer river drains, is then drained by the same river into Dawson bay, an arm of lake Winnipegosis.

Swan lake, drained by the Shoal river into Dawson bay which is the collecting basin for the Swan and Woody rivers.

Lake Dauphin, drained by the Mossy river and having as tributaries among others, the Valley and Ochre rivers. The Fork river is a tributary of the Mossy.

RED DEER RIVER.

The source of the Red Deer river is in Tp. 44, R.19 W.2.M. south of Melfort, Saskatchewan. It flows in a general easterly direction into Red Deer lake, an expanse of the river, and also drains the lake into lake Winnipegosis.

The total drainage area of the Red Deer is 5,478 square miles, including Red Deer lake which has an area of 100 square miles. The valley through which the river flows is deep and wide. In the upper portion the tributaries which head in small lakes and swamps are Fir, Etoimami, Pipestone and Barrier rivers, nearly all of which enter from the south.

The upper portion of the drainage area is well timbered, growths of spruce and poplar of merchantable size being found. The Red Deer Lumber Company carry on lumbering operations on the river and operate a saw mill on Red Deer lake, the logs being floated downstream to the mill.

The Canadian Northern Railway crosses the river at Erwood, thirty miles west of the lake, and a spur line has been built in from Powell to touch the west end of the lake at Barrows.

LAKE WINNIPEGOSIS AT WINNIPEGOSIS.

HISTORY.

A gauge was set on lake Winnipegosis on May 22, 1913, by G. Ebner, and during the open water seasons daily gauge records have been obtained at this point.

LOCATION OF GAUGE.

A six-foot vertical staff gauge has been secured to a pile thirty feet north of Standard Lumber Company's wharf in the Mossy river and about 350 feet from the point where the river empties into lake Winnipegosis.

RECORDS AVAILABLE.

Daily gauge readings at this point are available from May 22 to October 27, and at intervals during November and December of 1913, from April 16 to November 15, in 1914, and from May 18 to November 16, 1915.

RED DEER RIVER AT HUDSON'S BAY JUNCTION.

HISTORY.

The station on the Red Deer at Hudson's Bay Junction was established by G. Ebner on August 12, 1913, and replaced a station established by E. Bankson on June 4, 1913, four hundred feet below the ferry.

LOCATION OF SECTION.

The meter section is located at the ferry crossing of the Red Deer river five hundred feet below its confluence with the Elk river and three and one-half miles south of Hudson's Bay Junction on the road to the Red Deer Lumber Company's camp. The I.P. is marked by a nail driven in a pile sixty feet from the water's edge on the right bank at the ferry crossing.

RECORDS AVAILABLE.

Records of daily gauge height have been obtained from July 9 to October 31, 1913, April 30 to November 27, 1914, and from April 14 to December 31, 1915. A few gauge heights are also available taken during the winter seasons. Estimated daily discharges cover the period July 9 to October 31, 1913, April 30 to November 27, 1914, and from April 14 to November 9, 1915.

DRAINAGE AREA.

The area tributary to the Red Deer above the station at Hudson's Bay Junction is 1,900 square miles.

GAUGE.

The gauge is a vertical staff gauge driven into the bed of the river and braced; it is near the right bank and forty feet below the section. This gauge is referred to a permanent M.H.S.B.M. located fifty-two feet upstream from the I.P.

CHANNEL.

The channel is straight for about five hundred feet above and below the section; the river is confined to one channel at all stages; the bed of the stream is covered with boulders and not liable to shift. The banks of the river are low wooded and liable to overflow at high stages.

DISCHARGE MEASUREMENTS.

Meterings are made from a boat by means of a small Price meter.

ACCURACY.

Eleven discharge measurements define the curve fairly well between gauge heights 99·8 and 103·0. Owing to the fact that the Red Deer Lumber Company operate a number of lumber dams on the upper waters of the river the records do not give a true idea of the natural regimen of the river.

Discharge Measurements of Red Deer River at Hudson's Bay Junction, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 14..	M. S. Madden.....	1,462	100	97	0·02	99·23	2[1]
Feb. 9.	"	1,462	82	83	....	98·81	[1]
Mar. 4...	"	1,462	60	60	....	....	[1]
April 24..	F. S. Smith........	1,186	146	423	0·48	100·51	207
April 26...	"	1,186	146	423	0·51	100·48	214
May 1...	"	1,186	147	418	0·49	100·42	207
May 3...	"	1,186	146	399	0·45	100·39	180
June 1...	"	1,186	144	364	0·26	100·01	95
June 2...	"	1,186	144	359	0·28	100·02	101
July 3...	C. O. Allen........	2,018	152	433	0·68	100·60	295
Aug. 5...	"	2,018	124	399	0·78	100·59	311
Sept. 28...	"	2,018	147	341	0·28	100·06	96
Nov. 23...	M. S. Madden.....	1,462	111	262	0·06	99·85	14[1]

[1] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF RED DEER RIVER AT HUDSON'S BAY JUNCTION FOR 1915.

[Drainage area 4,900 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	......	......	......	......	......	......	......	......	100·45	193	100·02	88
2	......	......	......	......	......	......	......	......	100·40	175	100·02	88
3	......	......	......	......	......	......	......	......	100·40	175	100·02	88
4	......	......	......	......	......	0	......	......	100·30	145	100·00	85
5	......	......	......	......	......	......	......	......	100·30	145	100·05	93
6	......	......	......	......	......	......	......	......	100·30	145	100·20	120
7	......	......	......	......	......	......	......	......	100·30	145	100·30	145
8	......	......	......	......	......	......	......	......	100·35	160	100·35	160
9	......	......	98·81	0	......	......	......	......	100·45	193	100·40	175
10	......	......	......	......	......	......	......	......	100·40	175	100·40	175
11	......	......	......	......	......	......	......	......	100·35	160	100·42	182
12	......	......	......	......	......	......	......	......	100·30	145	100·38	169
13	......	......	......	......	......	......	......	......	100·30	145	100·40	175
14	99·23	2	......	......	......	......	102·40	1.745	100·25	132	100·40	175
15	......	......	......	......	......	......	102·20	1,515	100·25	132	100·40	175
16	......	......	......	......	......	......	101·20	600	100·25	132	100·40	175
17	......	......	......	......	......	......	101·15	565	100·25	132	100·40	175
18	......	......	......	......	......	......	101·05	500	100·20	120	100·35	160
19	......	......	......	......	......	......	100·90	410	100·15	110	100·35	160
20	......	......	......	......	......	......	100·70	300	100·15	110	100·35	160
21	......	......	......	......	......	......	100·70	300	100·10	100	100·35	160
22	......	......	......	......	......	......	100·60	250	100·10	100	100·32	151
23	......	......	......	......	......	......	100·50	210	100·15	110	100·32	151
24	......	......	......	......	......	......	100·50	210	100·15	110	100·30	145
25	......	......	......	......	......	......	100·50	210	100·15	110	100·30	145
26	......	......	......	......	......	......	100·45	193	100·10	100	100·30	145
27	......	......	......	......	......	......	100·45	193	100·15	110	100·30	145
28	......	......	......	......	......	......	100·45	193	100·20	120	100·38	169
29	......	......	......	......	......	......	100·45	193	100·10	100	100·45	193
30	......	......	......	......	......	......	100·45	193	100·05	93	100·55	230
31	......	......	......	......	......	......	......	......	100·05	93	......	......

	July.		August.		September.		October.		November.		December.	
1	100·55	230	101·00	470	100·13	106	100·07	95	100·02	88	99·87	......
2	100·58	242	100·90	410	100·08	97	100·07	95	100·02	88	99·87	......
3	100·60	250	100·80	350	99·98	83	100·05	92	100·02	88	99·87	......
4	100·75	325	100·70	300	99·93	77	100·02	88	99·99	84	99·92	......
5	100·82	362	100·58	242	99·90	74	100·02	88	99·99	84	99·92	......
6	100·85	380	100·53	222	99·88	72	99·97	82	99·99	84	99·92	......
7	100·80	350	100·43	185	99·88	72	99·97	82	99·99	84	99·92	......
8	100·70	300	100·36	163	100·18	116	99·97	82	99·99	84	99·97	......
9	100·60	250	100·30	145	99·93	77	99·92	76	99·97	82	100·02	......
10	100·60	250	100·23	128	99·83	68	99·92	76	100·05	......	100·02	......
11	100·72	310	100·23	128	99·83	68	99·92	76	99·92	......	99·92	......
12	100·90	410	100·18	116	99·83	68	99·92	76	99·92	......	99·92	......
13	101·40	740	100·13	106	99·83	68	99·92	76	99·87	......	99·97	......
14	101·45	780	100·08	97	99·83	68	99·92	76	99·87	......	99·97	......
15	101·40	740	100·03	90	99·83	68	99·92	76	99·87	......	99·92	......
16	101·70	980	99·98	83	99·93	77	99·92	76	99·82	......	99·87	......
17	102·30	1,630	100·03	90	99·83	68	99·89	73	99·82	......	99·87	......
18	102·45	1,802	100·03	90	99·88	72	99·89	73	99·82	......	99·97	......
19	102·45	1,802	100·08	97	99·88	72	99·89	73	99·82	......	99·97	......
20	102·25	1,573	100·13	106	99·98	83	99·89	73	99·82	......	99·97	......
21	102·05	1,342	100·18	116	99·93	77	99·89	73	99·82	......	99·97	......
22	101·80	1,070	100·33	154	99·93	77	99·92	76	99·82	......	99·97	......
23	101·68	964	100·28	140	99·93	77	99·92	76	99·82	14	99·92	......
24	101·50	820	100·23	127	99·98	83	99·92	76	99·82	......	99·92	......
25	101·35	705	100·20	120	100·03	90	99·92	76	99·87	......	99·92	......
26	101·22	614	100·16	112	100·03	90	99·92	76	99·87	......	99·92	......
27	101·15	565	100·23	127	100·06	94	99·95	80	99·92	......	99·92	......
28	101·15	565	100·23	127	100·05	92	99·95	80	99·92	......	99·92	......
29	101·20	600	100·20	120	100·07	95	99·97	82	99·87	......	99·92	......
30	101·15	565	100·18	116	100·07	95	99·97	82	99·87	......	99·92	......
31	101·10	530	100·13	106	......	......	100·02	88	......	......	99·92	......

NOTE.—Ice conditions from January 1 to April 13 and November 10 to December 31.
Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF RED DEER RIVER AT HUDSON'S BAY JUNCTION, FOR 1915.

[Drainage area 4,900 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Dept in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]1	0·000	0·000	..
February			[1]0	0·000	0·000	....
March			[1]1	0·000	0·000	....
April			[1]275	0·056	0·062	16,400
May	193	93	133	0·027	0·031	8,180
June	230	85	152	0·031	0·035	9,050
July	1,802	230	711	0·145	0·167	43,700
August	470	83	161	0·033	0·038	9,900
September	116	68	81	0·017	0·019	4,825
October	95	73	80	0·016	0·018	4,925
November	...	....	[1]36	0·007	0·008	2,140
December	...	...	[1]5	0·001	0·001	307
The Year	1,802	0	136	0·028	0·379	99,427

NOTE.—Marked thus (1) estimated.

SWAN RIVER.

The Swan river rises on the extreme northwestern slope of the Porcupine mountains. Its course is generally south and east until it reaches a point in Tp. 34, R. 3 W.P.M. when it turns and flows almost due northeast through the valley between Porcupine and Duck mountains into Swan lake.

The valley between the two mountains is broad and deep, but nearly all the drainage entering this section of the river is from the south, most of the tributaries heading in the Duck mountains. To the north the basin is confined by the drainage area of the Woody river which follows a parallel course to the Swan.

The banks of the valley are an alluvial deposit of clay and gravel. The river has an average width of one hundred and fifty feet, the banks ranging from ten to fifty feet in height. The upper parts of the valley are largely covered with a timber growth, but in the lower bottom lands mixed farming is extensively followed. The valley is well settled, the town of Swan River being the principal community.

In 1909 an investigation of the power possibilities of the river was made and a site located in the vicinity of Swan river with a view to supplying that town with power.

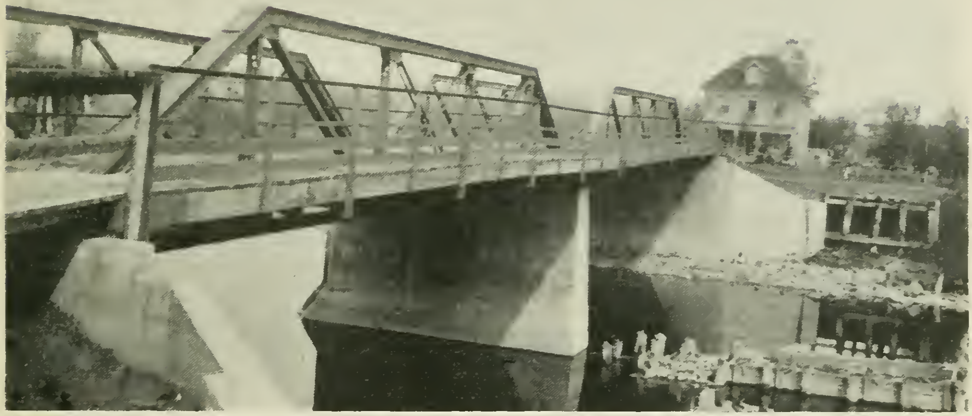
SWAN RIVER AT SWAN RIVER.

HISTORY.

The Swan River station was established by W. G. Worden on October 12, 1912, and has been operated since that date.

LOCATION OF SECTION.

The meter section is located on the downstream side of the new steel traffic bridge which spans the Swan river at the north end of the town of Swan River, Man. The I.P. is marked on the top of the south abutment at the east side.



Taken by F. S. Smith.

SWAN RIVER—SWAN RIVER—SHOWING I.P. AND POSITION OF B.M.

RECORDS AVAILABLE.

Records of daily gauge height are available for part of the period October 12, 1912, to the end of 1915. Blanks in the record occur during winter seasons. Estimated daily discharges are on hand for the periods October 24 to November 16, 1912, April 12 to November 8, 1913, April 15 to November 15, 1914, and from April 14 to November 15 1915.

DRAINAGE AREA.

The area drained above the station of the Swan river is 1,215 square miles.

GAUGE.

The gauge at this station is a chain gauge secured to the lower chord of the upstream side of the bridge; it is referred to a permanent M.H.S. B.M. located forty-five feet northeast of the north abutment of the bridge.

CHANNEL.

Above the section the channel is straight for three hundred feet and also for two hundred feet below. The bridge is a clear span and the river lies in one channel at all stages. The stream bed is of clay and subject to shifting; the current is swift. The right bank is of clay, is high and not liable to overflow. The left bank is low and wooded and liable to overflow at high stages.

DISCHARGE MEASUREMENTS.

The meterings are made from the bridge with a small Price current meter.

ACCURACY.

Between gauge heights 99·10 and 101·80 the discharge curve is well defined; between 101·80 and 101·20 it is fairly well defined.

DISCHARGE MEASUREMENTS OF SWAN RIVER AT SWAN RIVER, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec.-ft.
Jan. 8...	M. S. Madden.....	1,462	83	....	....	....	........[1]
Feb. 11...	"	1,462	81	151·7	....	102·92	........[1]
Mar. 3...	"	1,462	6	3·9	0·57	102·32	2·2[1]
Mar. 30...	"	1,462	164	51·5	0·49	103·69	25·7[1]
April 23...	F. S. Smith........	1,186	128	262·6	0·65	100·34	171·6
May 4...	"	1,186	124	233·3	0·48	100·04	110·8
May 29...	"	1,186	122	205·3	0·29	99·74	59·9
June 26...	C. O. Allen........	2,018	127	242·9	0·46	100·02	111·8
July 31...	H. H. Pratt........	1,496	132	270·8	0·56	100·22	152·4
Aug. 31...	"	1,496	126	201·1	0·28	99·75	56·9
Sept. 30...	C. O. Allen........	2,018	122	210·2	0·32	99·75	67·3
Nov. 18 ..	M. S. Madden....	1,462	108	149·2	0·21	99·68	30·8[1]

[1] Ice measurement.

Daily Gauge Height and Discharge of Swan River at Swan River, for 1915.

[Drainage area 1,215 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	....	....	....	....	....	....	103·80	....	100·09	132	99·74	53
2	....	....	....	....	....	....	103·81	....	100·07	126	99·72	50
3	....	....	....	....	102·32	2	103·83	....	100·05	120	99·72	50
4	....	....	....	....	....	....	103·88	....	100·05	120	99·71	49
5	....	....	....	....	....	....	103·90	....	100·02	111	99·72	50
6	....	....	....	....	....	....	103·92	....	99·99	103	99·75	55
7	....	....	....	....	....	....	103·94	....	99·96	96	99·86	74
8	....	....	....	....	....	....	104·03	....	99·95	94	99·91	84
9	....	....	....	....	....	....	103·59	....	99·94	91	99·88	78
10	....	....	....	....	....	....	103·38	....	99·88	78	99·97	98
11	....	....	102·92	0	....	....	103·12	....	99·89	80	100·01	108
12	....	....	....	....	....	....	102·63	....	99·90	82	100·01	108
13	....	....	....	....	....	....	102·60	....	99·89	80	100·02	111
14	....	....	....	....	....	....	101·82	1,142	99·92	86	100·02	111
15	....	....	....	....	....	....	101·64	989	99·89	80	100·00	105
16	....	....	....	....	....	....	101·58	938	99·89	80	100·00	105
17	....	....	....	....	....	....	101·57	930	99·90	82	100·00	105
18	....	....	....	....	....	....	101·52	887	99·89	80	99·99	103
19	....	....	....	....	....	....	101·51	879	99·87	76	99·99	103
20	....	....	....	....	....	....	101·51	879	99·87	76	100·02	111
21	....	....	....	....	....	....	101·49	863	99·83	68	99·99	103
22	....	....	....	....	....	....	101·49	863	99·80	62	100·00	105
23	....	....	....	....	....	....	101·21	653	99·78	59	100·08	129
24	....	....	....	....	....	....	100·81	415	99·78	59	100·10	135
25	....	....	....	....	....	....	100·34	209	99·77	58	100·07	126
26	....	....	....	....	....	....	100·19	162	99·77	58	100·03	114
27	....	....	....	....	....	....	100·14	147	99·77	58	100·02	111
28	....	....	....	....	....	....	100·12	141	99·77	58	100·02	111
29	....	....	....	....	....	....	100·11	138	99·77	58	100·02	111
30	....	....	....	....	....	....	100·09	132	99·72	50	100·02	111
31	....	....	....	....	103·69	26	....	....	99·76	56	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	100·01	108	100·16	153	99·74	53	99·78	59	99·74	53	99·70	
2	100·01	108	100·14	147	99·70	47	99·80	62	99·74	53	99·71	
3	100·01	108	100·11	138	99·64	39	99·80	62	99·75	55	99·70	
4	100·00	105	100·08	129	99·60	33	99·80	62	99·76	56	99·69	
5	99·99	103	100·05	120	99·60	33	99·80	62	99·77	58	99·69	
6	99·99	103	100·01	108	99·60	33	99·80	62	99·77	58	99·69	
7	100·01	108	99·96	96	99·60	33	99·80	62	99·77	58	99·69	
8	100·01	108	99·88	78	99·61	34	99·80	62	99·78	59	99·69	
9	100·01	108	99·85	72	99·59	32	99·80	62	99·78	59	99·70	
10	99·99	103	99·80	62	99·56	29	99·80	62	99·78	59	99·70	
11	99·99	103	99·75	55	99·56	29	99·80	62	99·79	61	99·70	
12	99·99	103	99·72	50	99·59	32	99·80	62	99·80	62	99·70	
13	99·97	98	99·67	43	99·59	32	99·80	62	99·80	62	99·70	
14	99·97	98	99·64	39	99·59	32	99·80	62	99·80	62	99·70	
15	100·26	183	99·63	37	99·59	32	99·80	62	99·80	62	99·70	
16	100·44	246	99·62	36	99·59	32	99·80	62	99·70		99·69	
17	100·57	299	99·59	32	99·59	32	99·80	62	99·70		99·70	
18	100·67	346	99·59	32	99·60	33	99·80	62	99·70		99·70	
19	100·81	415	99·62	36	99·60	33	99·80	62	99·69		99·70	
20	100·82	420	99·61	34	99·61	34	99·80	62	99·70		99·71	
21	100·78	400	99·66	41	99·62	36	99·79	61	99·70		99·72	
22	100·72	370	99·83	68	99·63	37	99·78	59	99·70		99·72	
23	100·65	336	99·87	76	99·64	39	99·78	59	99·75		99·70	
24	100·55	291	99·88	78	99·66	41	99·78	59	99·72		99·70	
25	100·50	270	99·85	72	99·72	50	99·75	55	99·70		99·70	
26	100·43	242	99·82	66	99·79	61	99·76	56	99·71		99·70	
27	100·39	227	99·94	91	99·79	61	99·74	53	99·70		99·69	
28	100·32	202	100·12	141	99·76	56	99·76	56	99·72		99·70	
29	100·28	189	99·78	59	99·76	56	99·74	53	99·75		99·70	
30	100·27	186	99·77	58	99·77	58	99·74	53	99·70		99·69	
31	100·24	177	99·77	58			99·74	53			99·70	

Note.—Ice conditions from January 1 to April 13 and from November 16 to end of year. Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF SWAN RIVER AT SWAN RIVER FOR THE YEAR 1915.

[Drainage area, 1,215 square miles.]

MONTH.	Discharge in Second-Feet				Run-Off	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]0	....	....	....
February	....	....	[1]0	....	....	....
March	....	....	[1]14	0·011	0·013	860
April	1,142	....	[1]400	0·329	0·367	23,800
May	132	50	81	0·067	0·077	5,000
June	135	49	96	0·079	0·088	5,700
July	420	98	202	0·166	0·191	12,400
August	153	32	74	0·061	0·070	4,550
September	61	32	39	0·032	0·036	2,325
October	62	53	60	0·049	0·056	3,690
November	62	....	[1]40	0·033	0·037	2,380
December	....	....	[1]10	0·008	0·009	615
The Year	1,142	32	85	0·070	0·944	61,320

NOTE.—Marked thus (1) estimated.

WOODY RIVER AT BOWSMAN.

HISTORY.

A metering station was established on the Woody river at Bowsman on May 31, 1915, by F. S. Smith, and since that time has been in operation.

LOCATION OF SECTION.

The section is located on the downstream side of a traffic bridge one mile south of the town of Bowsman. The Initial Point is painted on the lower bar, also on top of the hand rail at the north end of the bridge.

RECORDS AVAILABLE.

From the 31st of May to the 9th of November 1915, daily gauge readings and estimates of daily discharges are available. During this period discharge measurements have been made at the station and these are also available.

DRAINAGE AREA.

The drainage area tributary to the Woody river at this point is 731 square miles.

GAUGE.

A chain gauge has been established at this station referred to a permanent M.H.S. B.M. located forty-five feet east of the north end of the bridge. This B.M. is set to an arbitrary datum.

CHANNEL.

The channel is straight for about two hundred feet above and about six hundred feet below the section. The bed of the stream is of gravel and boulders and not liable to shift. The right bank is low and liable to overflow, but the embankment at the bridge confines the entire flow of the river to the channel at the section.

DISCHARGE MEASUREMENTS.

All discharge measurements are made from the bridge.

ACCURACY.

Throughout the range of stage covered by the discharge measurements obtained, the discharge curve is well defined.

Discharge Measurements of Woody River at Bowsman, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
May 31...	F. S. Smith........	1,186	64·0	54·7	0·31	88·57	16·8
June 28...	C. O. Allen........	2,018	72·5	78·1	0·72	88·90	56·2
July 31...	H. H. Pratt........	1,496	80·8	87·7	1·14	89·22	99·9
Aug. 31...	"	1,496	60·8	45·7	0·21	88·51	9·8
Sept. 30...	C. O. Allen........	2,018	59·0	53·1	0·21	88·51	11·2
Nov. 19...	M. S. Madden.....	1,462	40·0	30·1	0·17	88·70	5·0[1]

[1] Ice measurement.

Daily Gauge Height and Discharge of Woody River at Bowsman, for 1915.

[Drainage area 731 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	...	...	...	...	...	...	...	...	...	...	88·56	15
2	...	...	...	...	...	...	...	...	...	...	88·55	14
3	...	...	...	...	...	...	...	...	...	...	88·53	12
4	...	...	...	...	...	...	...	...	...	...	88·51	10
5	...	...	...	...	...	...	...	...	...	...	88·59	18
6	...	...	...	...	...	...	...	...	...	...	88·58	17
7	...	...	...	...	...	...	...	...	...	...	88·64	24
8	...	...	...	...	...	...	...	...	...	...	88·66	26
9	...	...	...	...	...	...	...	...	...	...	88·72	33
10	...	...	...	...	...	...	...	...	...	...	88·72	33
11	...	...	...	...	...	...	...	...	...	...	88·73	35
12	...	...	...	...	...	...	...	...	...	...	88·73	35
13	...	...	...	...	...	...	...	...	...	...	88·71	32
14	...	...	...	...	...	...	...	...	...	...	88·68	29
15	...	...	...	...	...	...	...	...	...	...	88·67	27
16	...	...	...	...	...	...	...	...	...	...	88·69	30
17	...	...	...	...	...	...	...	...	...	...	88·69	30
18	...	...	...	...	...	...	...	...	...	...	88·68	29
19	...	...	...	...	...	...	...	...	...	...	88·67	27
20	...	...	...	...	...	...	...	...	...	...	88·69	30
21	...	...	...	...	...	...	...	...	...	...	88·75	37
22	...	...	...	...	...	...	...	...	...	...	88·88	53
23	...	...	...	...	...	...	...	...	...	...	88·95	62
24	...	...	...	...	...	...	...	...	...	...	88·91	57
25	...	...	...	...	...	...	...	...	...	...	88·90	56
26	...	...	...	...	...	...	...	...	...	...	88·86	51
27	...	...	...	...	...	...	...	...	...	...	88·88	53
28	...	...	...	...	...	...	...	...	...	...	88·86	51
29	...	...	...	...	...	...	...	...	...	...	88·87	52
30	...	...	...	...	...	...	...	...	...	...	88·87	52
31	...	...	...	...	...	...	...	...	88·57	16	...	...

	July.		August.		September.		October.		November.		December.	
1	88·85	49	89·16	90	88·49	9	88·51	10	88·53	12	...	...
2	88·85	49	89·09	81	88·47	8	88·52	11	88·53	12	...	...
3	88·90	56	89·00	69	88·46	8	88·58	17	88·53	12	...	...
4	88·93	60	89·00	69	88·45	7	88·54	13	88·53	12	...	...
5	88·88	53	88·96	64	88·46	8	88·51	13	88·58	17	...	...
6	88·86	51	88·91	57	88·44	7	88·58	17	88·66	26	...	...
7	88·86	51	88·87	52	88·43	7	88·56	15	88·53	12	...	...
8	88·83	47	88·78	41	88·46	8	88·58	17	88·53	12	...	...
9	88·79	42	88·88	53	88·43	7	88·61	20	88·57	16	...	...
10	88·80	43	88·79	42	88·43	7	88·59	18	...	...	...	...
11	88·90	56	88·75	37	88·40	6	88·57	16	...	...	...	...
12	89·03	73	88·71	32	88·39	6	88·57	16	...	...	...	...
13	89·09	81	88·70	31	88·40	6	88·57	16	...	...	...	...
14	89·07	78	88·69	30	88·40	6	88·57	16	...	...	...	...
15	89·10	82	88·64	24	88·40	6	88·58	17	...	...	...	...
16	89·61	157	88·63	23	88·41	6	88·58	17	...	...	...	...
17	89·92	204	88·62	21	88·41	6	88·58	17	...	...	...	...
18	89·95	208	88·61	20	88·43	7	88·57	16	...	...	...	...
19	89·91	202	88·60	19	88·49	9	88·57	16	...	...	...	...
20	89·89	200	88·61	20	88·50	9	88·57	16	...	...	...	...
21	89·86	195	88·61	20	88·49	9	88·56	15	...	...	...	...
22	89·82	189	88·60	19	88·48	8	88·56	15	...	...	...	...
23	89·75	178	88·60	19	88·48	8	88·56	15	...	...	...	...
24	89·65	163	88·60	19	88·47	8	88·55	14	...	...	...	...
25	89·58	153	88·58	17	88·48	8	88·55	14	...	...	...	...
26	89·47	137	88·53	12	88·50	9	88·55	14	...	...	...	...
27	89·37	122	88·53	12	88·51	10	88·54	13	...	...	...	...
28	89·33	116	88·58	17	88·51	10	88·54	13	...	...	...	...
29	89·29	110	88·57	16	88·51	10	88·54	13	...	...	...	...
30	89·25	103	88·55	14	88·51	10	88·54	13	...	...	...	...
31	89·23	100	88·51	10	...	...	88·53	12	...	...	...	...

Monthly Discharge of Woody River at Bowsman for 1915.

[Drainage area 731 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage Area.	Total in acre-feet.
June	62	10	34	0·047	0·052	2,020
July	208	42	110	0·150	0·173	6,750
August	90	10	34	0·047	0·054	2,090
September	10	6	8	0·011	0·012	476
October	20	10	15	0·021	0·024	922
November			[1]10	0·014	0·016	595
The Period	208	6	35	0·048	0·331	12,853

Note.—Marked thus (1) estimated.

MOSSY RIVER.

The Mossy river is the connecting link between lake Dauphin and lake Winnipegosis, draining the former into the latter. It heads in the extreme northern end of lake Dauphin and flows generally north for a distance of about twenty-one miles.

The Fork and Fishing rivers are tributaries that have their sources on the eastern slope of the Duck mountains. All the basin of the Mossy river, with the exception of that supplied by these rivers, is gathered by the rivers tributary to lake Dauphin. These are the Valley, Turtle, Ochre, Wilson and Vermilion rivers. The upper part of the basin is well timbered, while the lower part is prairie country and used extensively for mixed farming.

The banks of the Mossy vary between five and fifteen feet in height and are of clay overlying a bed of gravel. The river varies in width from 120 to 200 feet and has been considerably improved by dredging.

The country adjacent to the river is very well settled, especially on the west side. The town of Winnipegosis, with a population of 600 people, is situated at the mouth of the river, and the town of Dauphin is the chief centre in the district.

In 1908 the Department of Public Works made a survey of the river, with a view of lowering lake Dauphin. In connection with this project, dredging operations were carried on in the river between 1908 and 1912. A water power project has been looked into on the river near Winnipegosis, and a reconnaissance survey for this purpose was made by a field party of the Manitoba Hydrometric Survey, in the summer of 1913.

MOSSY RIVER AT WILSON'S FARM (BELOW FORK RIVER).

HISTORY.

This station was established on July 28, 1914, by W. J. Ireland, and superseded the one at Lacey's farm owing to the difficulty in securing a gauge reader at that point.

LOCATION OF SECTION.

The meter section is located on Wilson's farm two and one-half miles northeast of Fork river. It is marked by a blazed poplar tree which stands on the left bank just below the metering section. The I.P. is located by a nail driven in the post supporting the cable of the section on the left hand bank.

RECORDS AVAILABLE.

Daily gauge height records have been kept from July 3, 1914, to December 31, 1915. Daily discharges have been computed for a period from July 3 to November 16, 1914, and from March 22 to November 10, 1915. The data secured has not been sufficient to permit the compilation of discharge under ice conditions, which held during the periods from November 16, 1914, to March 22, 1915, and from November 10, 1915, to the end of the year.

DRAINAGE AREA.

The drainage area is 3,950 square miles.

GAUGE.

A six-foot vertical staff gauge is located about nine hundred feet downstream from the section and thirty feet southeast from Mr. Wilson's residence. The gauge is driven into the bed of the stream and braced to the shore. It is referenced to a permanent M.H.S. B.M. located one hundred feet southwest from the gauge.

CHANNEL.

The channel is straight for one hundred and fifty feet above and three hundred feet below the section. The river is confined to a single channel under all stages. The bed of the river is of gravel and permanent. The banks are high and covered with scrub but not liable to overflow.

DISCHARGE MEASUREMENTS.

Meterings are made by means of a cable carrier running on a cable stretched across the river.

ACCURACY.

The discharge curve is fairly well defined over the range in stage covered by the meterings.

Discharge Measurements of Mossy River at Wilson's Farm, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 6	M. S. Madden	1,462	86	239	0·65	91·72	155[1]
Feb. 15	"	1,462	77	226	0·71	91·71	161[1]
Mar. 12	"	1,462	79	264	0·67	91·60	177[1]
April 19	F. S. Smith	1,186	86	275	0·80	90·71	221
May 7	"	1,186	86	264	0·70	90·71	186
May 28	"	1,186	82	254	0·73	90·60	186
June 25	C. O. Allen	2,018	85	238	0·79	90·63	187
July 30	H. H. Pratt	1,496	82	194	0·52	90·48	101
Aug. 30	"	1,496	78	175	0·34	90·04	61
Oct. 2	C. O. Allen	2,018	80	205	0·52	90·11	107
Nov. 17	M. S. Madden	1,462	77	196	0·36	90·22	71[1]

[1] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF MOSSY RIVER BELOW FORK RIVER FOR 1915.

[Drainage area 3,950 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Dis. charge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	91·56	....	91·53	....	91·71	....	92·27	581	90·78	207	90·58	175
2	91·55	....	91·54	....	91·73	....	92·12	539	90·77	205	90·59	177
3	91·55	....	91·53	....	91·79	....	92·01	508	90·68	191	90·56	172
4	91·62	....	91·54	....	91·81	....	92·01	508	90·59	177	90·48	160
5	91·64	....	91·55	....	91·82	....	91·85	463	90·18	117	90·48	160
6	91·72	155	91·53	....	91·75	....	91·50	365	90·58	175	90·58	175
7	91·74	....	91·63	....	91·61	....	90·80	210	90·69	192	90·59	177
8	91·69	....	91·66	....	91·73	....	90·78	207	90·18	117	90·35	141
9	91·70	....	91·68	....	91·75	....	90·74	200	90·78	207	90·58	175
10	91·73	....	91·67	....	91·68	....	90·74	200	90·69	192	90·59	177
11	91·71	....	91·68	....	91·71	....	90·72	197	90·67	189	90·58	175
12	91·72	....	91·72	....	91·69	177	90·69	192	90·50	163	90·59	177
13	91·53	....	91·84	....	91·56	....	90·82	213	90·63	183	90·57	174
14	91·53	....	91·73	....	91·60	....	90·77	205	90·77	205	90·68	191
15	91·73	....	91·71	161	91·63	....	90·82	213	90·67	189	90·38	145
16	91·74	....	91·86	....	91·61	....	90·78	207	90·18	117	90·58	160
17	91·76	....	91·86	....	91·49	....	90·76	204	90·56	172	90·68	191
18	91·76	....	91·86	....	91·11	....	90·77	205	90·67	189	90·60	178
19	91·52	....	91·63	....	91·00	....	90·76	204	90·68	191	90·63	183
20	91·43	....	91·83	....	91·23	....	90·75	202	90·68	191	90·66	188
21	91·62	....	91·84	....	91·56	....	90·76	204	90·60	178	90·88	224
22	91·66	....	91·87	....	92·25	575	90·68	191	90·67	189	90·32	137
23	91·64	....	91·90	....	92·21	564	90·70	194	90·53	168	90·88	224
24	91·50	....	91·87	....	92·13	541	90·71	196	90·54	169	90·63	183
25	91·58	....	91·71	....	91·87	497	90·75	202	90·61	180	90·77	205
26	91·56	....	91·59	....	92·68	695	90·77	205	90·59	177	90·68	191
27	91·53	....	91·73	....	92·89	754	90·78	207	90·69	192	90·64	184
28	91·52	....	91·83	....	92·48	639	90·53	168	90·63	183	90·53	168
29	91·51	....	....	....	92·53	653	90·63	183	90·73	199	90·58	175
30	91·50	....	....	....	92·50	645	90·78	207	90·68	191	90·48	160
31	91·46	....	....	....	92·45	631	....	....	90·48	160	....	....

	July.		August.		September.		October.		November.		December.	
1	90·57	174	90·56	172	89·98	91	90·13	111	90·00	94	90·15	...
2	90·50	163	90·47	159	89·96	89	90·15	114	90·10	107	89·88	...
3	90·48	160	90·49	162	89·98	91	90·10	107	90·21	121	90·36	...
4	90·38	145	90·50	163	90·13	111	90·09	106	90·12	110	90·39	...
5	90·58	175	90·48	160	90·07	103	90·25	127	90·21	121	90·40	...
6	90·67	189	90·36	142	90·13	111	89·98	91	90·12	110	90·42	...
7	90·66	188	90·32	137	90·08	104	89·85	75	90·21	121	90·43	...
8	90·63	183	90·30	134	89·87	77	89·98	91	89·99	93	90·46	
9	90·78	207	90·36	142	90·06	102	90·50	163	90·07	103	90·52	...
10	90·78	207	90·35	141	89·98	91	90·20	120	90·58	175	90·52	...
11	90·68	191	90·32	137	89·68	53	90·08	104	90·16		90·36	
12	90·64	184	90·23	124	90·08	104	90·26	128	89·66		90·34	
13	90·48	160	90·27	130	90·02	97	90·25	127	90·20		90·40	
14	90·38	145	90·18	117	89·92	84	90·10	107	90·15		90·39	
15	90·47	159	90·23	124	90·08	104	90·19	119	90·20		90·34	
16	90·83	215	90·18	117	89·94	86	90·15	114	90·22		90·31	...
17	90·67	189	90·31	135	90·30	134	90·20	120	90·23	71	90·33	...
18	90·89	225	90·37	144	89·97	90	90·16	115	[1]90·26		90·33	...
19	90·98	241	90·33	138	90·26	128	90·15	114	[1]90·26		90·33	...
20	91·27	304	90·20	120	89·73	59	89·55	37	90·29		90·35	
21	91·36	327	90·08	104	90·05	101	90·08	104	90·31		90·32	
22	91·33	319	90·23	124	90·27	130	90·15	114	90·33		90·32	...
23	91·18	283	89·96	89	90·06	102	90·10	107	90·33		90·34	...
24	91·03	251	89·95	88	90·06	102	90·18	117	90·35		90·34	
25	90·97	240	89·81	69	90·17	116	90·12	110	90·35		90·30	
26	90·88	224	90·13	111	89·88	78	89·50	31	90·39		90·20	
27	90·84	217	90·16	115	90·10	107	90·50	163	90·38		90·26	
28	90·71	196	89·95	88	90·18	117	89·90	81	90·40		90·34	
29	90·58	175	90·01	95	90·10	107	90·21	121	90·38		90·30	
30	90·58	175	90·09	106	90·06	102	90·12	110	90·36		90·29	
31	90·58	175	90·09	106	...	...	90·20	120			90·32	

NOTE.—Gauge heights marked thus (1) interpolated.
Ice conditions from January 1 to March 21 and November 11 to end of year
Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF MOSSY RIVER BELOW FORK RIVER FOR THE YEAR 1915.

[Drainage area, 3,950 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre feet.
January			[1]150	0·038	0·044	9,200
February	.....	....	[1]160	0·041	0·043	8,900
March	754	....	[1]300	0·076	0·088	18,400
April	581	168	259	0·066	0·074	15,400
May	207	117	179	0·045	0·052	11,000
June	224	137	177	0·045	0·050	10,500
July	327	145	206	0·052	0·060	12,700
August	172	69	126	0·032	0·037	7,750
September	134	53	99	0·025	0·028	5,900
October	163	31	109	0·028	0·032	6,700
November	....	....	[1]80	0·020	0·022	4,750
December	....	....	[1]65	0·016	0·018	4,000
The Year.	754	......	160	0·040	0·518	115,200

NOTE.—Marked thus (1) estimated.

MOSSY RIVER AT LAKE DAUPHIN.

HISTORY.

On May 20, 1913, a gauge was established at the head of the Mossy river by G. Ebner; and from that date gauge readings have been recorded at this station.

LOCATION OF GAUGE.

The gauge is a six-foot vertical staff gauge secured to a support driven into the bed of the river and braced to crib of Clendenning's bridge. This bridge is across the Mossy river about one hundred and fifty feet below the point at which it flows out of Lake Dauphin, and the gauge registers lake level.

RECORDS AVAILABLE.

Gauge records at this point are available for the following periods, from May 21 to December 31, 1913, from January 1 to December 31, 1914, and from January 1 to September 30, 1915.

VALLEY RIVER.

The Valley river is a tributary of lake Dauphin; it rises on the western slope of the Duck mountains, flows south along the foot of the western slope of these mountains, then turns east and flows between the Duck and Riding mountains and continues this generally easterly course to its mouth. There are two tributaries to the valley which are of fair size. These are Short creek, which rises on the slope of Riding mountains, and Drifting river, which joins the Valley three miles west of Valley River station on the C.N.R.

The valley between the Riding and Duck mountains, through which the river flows and from which it takes its name, is about one hundred feet deep and from seven hundred to twenty-five hundred feet wide. The river at ordinary summer stages has a width of between one hundred and two hundred feet. The river bed is composed of gravel and boulders, the banks being of clay which overlies a gravel and boulder bed.

The upper part of the drainage area is practically all within the Duck Mountain Forest Reserve, where considerable stands of spruce, jackpine and poplar are to be found. In the immediate vicinity of the river little clearing has been done, though in the lower part of the valley, and somewhat back from the river, farming is carried on to a considerable extent.

VALLEY RIVER AT VALLEY RIVER.

HISTORY.

This station was established on October 25, 1912, by W. G. Worden, and has been in operation since that date.

LOCATION OF SECTION.

The metering section is located on the downstream side of the C.N.R. bridge crossing the Valley river fifteen hundred feet north of the railroad station in that town and one hundred and fifty feet upstream from the traffic bridge. The I.P. is an arrow carved and painted on the downstream side of the bridge at the south end.

RECORDS AVAILABLE.

Records of daily gauge heights have been secured for the greater part of the period October 25, 1912, to the end of 1915. Estimates of daily discharge have been computed for the following periods:—October 25 to November 17, 1912, April 4 to November 16, 1913. April 25 to November 16, 1914, and from April 12 to November 17, 1915. There is not sufficient information to arrive at estimates of daily discharge under winter conditions.

DRAINAGE AREA.

The area tributary to the Valley river above the station is 1,028 square miles.

GAUGE.

A twelve-foot vertical staff gauge is secured to the downstream side of the south bridge abutment, 264 feet from the I.P. on the section. The gauge is referred to a permanent M.H.S. B.M. located 48 feet south of gauge. This B.M. is set to an arbitrary datum.

CHANNEL.

During low stages the water is confined to one channel, but under high water conditions there are two. The channel is straight for 400 feet above and 600 feet below the section. The bed of the stream is of gravel and sand and permanent. The right bank is low, wooded and liable to overflow. The left bank is high and not liable to overflow.

DISCHARGE MEASUREMENTS.

Meterings are taken from the downstream side of the bridge and cover a range in gauge height of 6·6 feet.

ACCURACY.

The discharge curve is well defined between gauge heights 99.5 and 101.7, between gauge heights 101·7 and 105·0 the discharge curve is not well defined.

DISCHARGE MEASUREMENTS OF VALLEY RIVER AT VALLEY RIVER, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 16	M. S. Madden.						[1]
Mar. 12	"						[1]
Mar. 29	"						[1]
April 22	F. S. Smith.	1,186	52	91·7	0·92	100·33	84·4
May 7	"	1,186	50	78·2	0·65	100·03	50·7
May 27	"	1,186	47	64·3	0·49	99·90	31·8
June 25	C. O. Allen.	2,018	51	102·4	1·18	100·54	120·8
July 30	H. H. Pratt.	1,496	51	73·5	0·51	99·92	37·1
Aug. 30	"	1,496	41	32·9	0·06	99·23	2·0
Oct. 1	C. O. Allen.	2,018	48	74·9	0·76	100·10	56·9
Nov. 17	M. S. Madden	1,462	39	45·0	0·36	99·65	16·3 [2]

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[1] Section frozen solid.

[2] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF VALLEY RIVER AT VALLEY RIVER FOR 1915.

[Drainage area 1,028 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	......	......	......	......	......	......	100·34	......	100·21	63	99·98	39
2	......	......	......	......	......	......	100·58	......	100·15	57	99·95	37
3	......	......	......	......	......	......	100·46	......	100·13	54	99·91	33
4	......	......	......	......	......	......	100·42	......	100·09	50	99·89	31
5	......	......	......	......	......	......	100·76	......	100·11	52	99·91	33
6	......	......	......	......	......	......	100·84	......	100·05	46	100·03	44
7	......	......	......	......	......	......	100·95	......	100·04	45	100·07	48
8	......	......	......	......	......	......	101·04	......	100·03	44	100·11	52
9	......	......	......	......	......	......	101·36	......	100·03	44	100·36	82
10	......	......	......	......	......	......	101·31	......	99·99	40	100·33	78
11	......	......	......	......	......	......	101·34	......	100·03	44	100·44	93
12	......	......	......	......	......	0	100·98	189	100·45	94	100·37	83
13	......	......	......	......	......	......	101·06	206	100·27	70	100·40	87
14	......	......	......	......	......	......	101·01	195	100·18	60	100·37	83
15	......	......	......	......	......	......	100·86	164	100·10	51	100·36	82
16	......	0	......	......	......	......	100·63	122	100·05	46	100·35	81
17	......	......	......	......	......	......	100·62	120	100·03	44	100·21	63
18	......	......	......	......	......	......	100·46	98	99·98	39	100·33	78
19	......	......	......	......	......	......	100·49	100	99·97	38	100·35	81
20	......	......	......	......	......	......	100·39	86	99·97	38	100·43	91
21	......	......	......	......	......	......	100·33	78	100·31	75	100·39	86
22	......	......	......	......	......	......	100·32	77	100·50	101	100·36	82
23	......	......	......	......	......	......	100·58	114	100·31	75	100·55	109
24	......	......	......	......	......	......	100·99	191	100·11	52	100·61	119
25	......	......	......	......	......	......	100·68	131	100·02	43	100·55	109
26	......	......	......	......	......	......	100·37	83	99·93	35	100·53	106
27	......	......	......	......	......	......	100·35	81	99·88	30	100·48	98
28	......	......	......	......	......	......	100·28	72	100·38	84	100·43	91
29	......	......	......	......	100·21	0	100·33	78	100·09	50	100·42	90
30	......	......	......	......	100·11	......	100·29	73	100·02	43	100·40	87
31	......	......	......	......	100·16	......	......	......	99·99	40	......	......

Day.	July.		August.		September.		October.		November.		December.	
1	100·36	82	99·90	32	99·23	2	100·07	48	100·05	46	99·46	......
2	100·33	78	99·88	30	99·28	3	100·05	46	100·02	43	99·52	......
3	100·32	77	99·84	27	99·29	3	100·03	44	100·00	41	99·51	......
4	100·33	78	99·72	18	99·28	3	100·03	44	99·97	38	99·51	......
5	100·31	75	99·64	13	99·28	3	100·05	46	99·95	37	99·47	......
6	100·27	70	99·68	16	99·26	3	100·06	47	99·95	37	99·48	......
7	100·20	62	99·70	17	99·28	3	100·06	47	99·94	36	99·46	......
8	100·08	49	99·66	15	99·34	3	100·07	48	99·92	34	99·46	......
9	100·06	47	99·60	11	99·40	4	100·08	49	99·90	32	99·44	......
10	100·04	45	99·59	11	99·56	9	100·07	48	99·87	30	99·45	......
11	100·01	42	99·56	9	99·67	12	99·96	37	99·96	37	99·46	......
12	99·99	40	99·52	8	99·70	17	99·94	36	99·82	25	99·46	......
13	99·94	36	99·48	6	99·71	18	99·94	36	99·73	19	99·46	......
14	100·27	70	99·46	6	99·82	26	99·93	35	99·72	18	99·44	......
15	100·47	97	99·45	6	99·81	25	99·92	34	99·72	18	99·43	......
16	100·62	120	99·42	5	99·81	25	99·92	34	99·72	18	99·42	......
17	100·74	141	99·40	4	99·82	26	99·91	33	99·66	16	99·42	......
18	101·02	197	99·40	4	99·82	26	99·90	32	99·62	......	99·41	......
19	101·04	202	99·37	4	99·84	27	99·90	32	99·60	......	99·42	......
20	101·08	211	99·35	4	99·84	27	99·90	32	99·58	......	99·41	......
21	101·03	200	99·35	4	99·86	29	99·90	32	99·58	......	99·40	......
22	100·92	174	99·34	3	99·88	30	99·91	33	99·58	......	99·40	......
23	100·54	107	99·32	3	99·89	31	99·92	34	99·59	......	99·39	......
24	100·52	104	99·31	3	99·90	32	99·93	35	99·60	......	99·39	......
25	100·48	98	99·30	3	99·94	36	99·92	34	99·60	......	99·38	......
26	100·32	77	99·28	3	99·98	39	99·91	33	99·61	......	99·38	......
27	100·15	57	99·26	3	99·98	39	99·91	33	99·62	......	99·38	......
28	100·12	53	99·26	3	99·96	38	99·92	34	99·60	......	99·38	......
29	100·03	44	99·24	2	100·00	41	99·93	35	99·56	......	99·37	......
30	99·92	34	99·23	2	100·02	43	99·95	37	99·52	......	99·36	......
31	99·91	33	99·23	2	......	......	99·97	38	......	......	99·37	......

NOTE—Ice conditions from January 1 to April 11, November 12 to December 31
Information insufficient to compute daily discharges.

Monthly Discharge of Valley River at Valley River for 1915.

[Drainage area, 1,028 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	0[1]	0[1]	0[1]	0[1]	....	......
February	0[1]	0[1]	0[1]	0[1]	....	....
March	0[1]	0[1]	0[1]	0[1]	....	....
April	206	0[1]	80[1]	0·078	0·087	4,775
May	101	30	53	0·052	0·059	3,250
June	119	31	76	0·074	0·083	4,525
July	211	33	90	0·089	0·103	5,550
August	32	2	9	0·009	0·010	553
September	43	2	21	0·020	0·022	1,250
October	49	32	38	0·039	0·045	2,340
November	46	0[1]	20[1]	0·020	0·022	1,190
December	0[1]	0[1]	0[1]	....	....	....
The Period	206	0	32	0·032	0·431	23,433

Note.—Marked thus(1) estimated.

OCHRE RIVER.

The Ochre river is a small tributary of lake Dauphin. It rises on the northeastern slope of Riding mountain and flows northeast to the lake, its mouth being in Tp. 20, R. 17, West of the First meridian. The total drainage area of the river is approximately 270 square miles, of which 250 square miles lies above the metering station at Ochre river.

OCHRE RIVER AT OCHRE RIVER.

HISTORY.

This station was established by W. G. Worden on October 18, 1912, and has been in operation since that date.

LOCATION OF SECTION.

The metering section on the Ochre river is located on the downstream side of the traffic bridge, which is one quarter of a mile north of the railway station and one quarter of a mile below the C.N.R. bridge. The I.P. is marked on the guard rail seven feet from the south end on the downstream side.

RECORDS AVAILABLE.

Records of daily gauge height have been obtained for the period October 18, 1912, to the 14th of November, 1915, with omission during the winter months. Estimates of daily discharge have been obtained for the same period.

DRAINAGE AREA.

The drainage area of the Ochre river above Ochre river is 250 square miles.

GAUGE.

A nine-foot vertical staff enamelled gauge is fastened to a timber which is spiked to a pile of the bridge at the south end on the downstream side. This gauge is referred to a permanent M.H.S. B.M. located about nine feet southeast of gauge. This B.M. is set to an arbitrary datum.

CHANNEL.

The channel just above the section is divided by a pile bent which supports the bridge. For fifty feet above and three hundred feet below the station the channel is straight. The bed of the stream is of sand and gravel with a vegetable growth. The banks are low and wooded and liable to overflow at high stages.

DISCHARGE MEASUREMENTS.

The discharge measurements are taken from the downstream side of the bridge under open water conditions. During the winter season they are made from the ice at a point about one hundred feet downstream from the bridge.

ACCURACY.

Between gauge heights 99·5 and 101·3 the curve is well defined, between 101·3 and 107·3 the curve is not well defined. Under ice conditions a fairly well defined curve for the range in gauge height 99·2 to 100·4 has been obtained.

Discharge Measurements of Ochre River at Ochre River, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 11	M. S. Madden	1,462	8·5	....	....	....	No flow.[1]
Mar. 27	"	1,462	38·0	13·4	0·27	101·74	3·6
April 21	F. S. Smith	1,186	40·0	48·7	1·22	100·68	58·8
April 21	"	1,186	40·0	48·2	1·34	100·67	64·5
April 21	"	1,186	40·0	48·2	1·29	100·66	62·3
May 6	"	1,186	40·0	33·7	0·82	100·30	27·6
May 6	"	1,186	40·0	33·7	0·77	100·30	26·0
May 6	"	1,186	40·0	33·7	0·79	100·30	26·6
May 26	"	1,186	39·4	35·6	1·06	100·39	37·8
May 26	"	1,186	39·4	35·6	1·10	100·39	39.3
June 24	C. O. Allen	2,018	37·8	38·8	1·34	100·41	52·0
Aug. 2	H. H. Pratt	1,496	32·0	14·5	0·98	99·92	14·3
Sept. 1	"	1,496	27·0	6·2	0·67	99·55	4·2
Oct. 5	C. O. Allen	2,018	37·0	47·0	1·17	100·75	55·2
Nov. 25	M. S. Madden	1,462	26·0	33·0	0·56	100·40	18·6[1]

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[1] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF OCHRE RIVER AT OCHRE RIVER, FOR 1915.

[Drainage area 250 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	......	......	......	......	......	......	101·60	......	100·59	82	100·07	26
2	......	......	......	......	......	......	101·51	......	100·53	75	100·06	25
3	......	......	......	......	......	......	101·52	......	100·50	71	100·00	20
4	......	......	......	......	......	......	101·51	......	100·43	63	100·00	20
5	......	......	......	......	......	......	101·68	......	100·42	61	100·10	28
6	......	......	......	......	......	......	101·66	......	100·42	61	100·12	30
7	......	......	......	......	......	......	101·80	......	100·41	60	100·29	47
8	......	......	......	......	......	......	102·38	......	100·46	66	100·43	63
9	......	......	......	......	......	......	102·37	......	100·43	63	100·60	83
10	......	......	......	......	......	......	102·22	......	100·42	61	100·88	118
11	......	......	......	......	......	......	102·17	......	100·43	63	100·78	105
12	......	......	......	......	......	......	101·76	246	101·26	171	100·69	94
13	......	......	......	......	......	......	101·69	235	101·05	142	100·52	73
14	......	......	......	......	......	......	101·34	183	101·05	142	100·45	65
15	......	......	......	......	......	......	101·25	170	100·70	95	100·60	83
16	......	......	......	......	......	......	101·23	167	100·70	95	100·60	83
17	......	......	......	......	......	......	101·19	162	100·68	93	100·60	83
18	......	......	......	......	......	......	100·92	124	100·66	90	100·53	75
19	......	......	......	......	......	......	100·79	107	100·47	67	100·44	64
20	......	......	......	......	......	......	100·62	85	100·37	56	100·35	53
21	......	......	......	......	......	......	100·61	84	100·36	55	100·42	61
22	......	......	......	......	101·63	......	100·85	115	100·28	46	100·43	63
23	......	......	......	......	101·64	......	100·78	105	100·26	44	100·37	56
24	......	......	......	......	101·64	......	100·73	99	100·25	42	100·47	67
25	......	......	......	......	101·78	......	100·74	100	100·35	53	100·43	63
26	......	......	......	......	101·78	......	100·87	117	100·37	56	100·43	63
27	......	......	......	......	101·74	4	100·86	116	100·36	55	100·67	91
28	......	......	......	......	101·74	......	100·80	108	100·24	41	100·56	78
29	......	......	......	......	101·66	......	100·70	95	100·16	33	100·43	63
30	......	......	......	......	101·63	......	100·63	87	100·14	32	100·37	56
31	......	......	......	......	101·61	......	......	......	100·10	28	......	......

	July.		August.		September.		October.		November.		December.	
1	100·31	49	99·90	14	99·55	3	101·15	156	100·76	95	..	
2	100·26	44	99·92	15	99·55	3	101·10	149	100·62	85		
3	100·27	45	99·91	15	99·57	3	101·00	135	100·54	76		
4	100·55	77	99·83	10	99·71	5	100·85	114	100·52	73		
5	100·48	69	99·81	9	99·62	3	100·70	95	100·50	71		
6	100·30	48	99·81	9	99·62	3	100·60	83	100·34	52		
7	100·22	39	99·79	9	99·82	10	100·58	81	100·40	59		
8	100·14	32	99·72	6	100·17	31	100·53	75	100·40	59		
9	100·09	27	99·72	6	100·23	40	100·49	70	100·41	60		
10	100·09	27	99·71	5	100·06	25	100·47	67	100·42	61		
11	100·20	37	99·71	5	99·93	16	100·42	61	100·42	61		
12	100·22	39	99·70	5	99·86	12	100·40	59	100·43	63		
13	100·14	32	99·69	5	99·87	12	100·35	53	100·43	63		
14	100·07	26	99·69	5	99·96	18	100·34	52	100·43	63		
15	100·75	101	99·67	4	99·98	19	100·32	50	......	...		
16	100·93	125	99·71	5	100·03	22	100·30	48				
17	101·39	190	99·70	5	99·97	18	100·30	48				
18	101·23	167	99·69	5	99·96	18	100·25	42				
19	101·13	153	99·76	7	99·96	18	100·25	42				
20	100·91	122	99·76	7	100·66	90	100·20	37				
21	100·51	72	99·73	6	100·66	90	100·18	35				
22	100·47	67	99·64	4	100·46	66	100·18	35				
23	100·34	52	99·63	4	100·36	55	100·16	33				
24	100·21	38	99·62	3	100·26	44	100·16	33				
25	100·14	32	99·62	3	100·26	44	100·25	42	100·10	19		
26	100·11	29	99·62	3	100·14	32	100·35	53				
27	100·09	27	99·61	3	100·27	45	100·45	65				
28	100·00	20	99·59	3	100·27	45	100·67	91				
29	99·97	18	99·56	3	100·65	89	100·85	114				
30	99·91	15	99·57	3	101·16	157	100·78	105				
31	99·91	15	99·57	3	....	..	100·75	102				

NOTE.—Ice conditions from January 1 to April 12 and from November 15 to December 31. Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF OCHRE RIVER AT OCHRE RIVER FOR THE YEAR 1915.
[Drainage area 250 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January			[1]0	0·000	0·000	
February			[1]0	0·000	0·000	
March		0	[1]2	0·008	0·009	123
April	246		[1]95	0·380	0·434	5,650
May	171	28	70	0·280	0·323	4,300
June	118	20	63	0·252	0·281	3,750
July	190	15	59	0·236	0·272	3,600
August	15	3	6	0·024	0·028	369
September	157	3	35	0·140	0·156	2,100
October	156	33	72	0·288	0·332	4,400
November			[1]40	0·160	0·179	2,400
December			[1]4	0·016	0·018	246
The Year	246	0	37	0·149	2·022	26,938

NOTE.—All marked thus(1) estimated.

INDEX TRIBUTARIES OF LAKE WINNIPEG FROM THE WEST.

GENERAL.

The rivers coming under this head are the Saskatchewan, Fairford and Dauphin, though they are included in that part known for administration purposes as the District west of lake Winnipegosis.

The Saskatchewan is very important from a navigation, reclamation and power standpoint. The Fairford is also important and to some extent for the above reasons. Its chief importance is that it forms the only outlet of lake Manitoba and through it lake Winnipegosis, lake Dauphin, Swan lake and Red Deer lake are drained.

SASKATCHEWAN RIVER.

The Saskatchewan river is one of the principal tributaries of lake Winnipeg; it flows into that lake near the northern end and drains a large territory to the west of the lake. The total drainage area is 155,000 square miles, extending from the summit of the Rocky mountains eastward to lake Winnipeg. There are two main branches of the river, known as the North and South Saskatchewan. The north branch heads in the Rockies southwest of Edmonton, and flows generally east to its junction with the south branch about fifty miles east of Prince Albert. The tributaries entering the river from the north are small, as the northern limit of the basin follows the river itself closely. The south branch is formed by the junction of the Bow and Old Man rivers, and below the junction of these two the Red Deer enters.

In the province of Manitoba the country adjacent to the river is low lying and swampy, a considerable portion of the level being liable to flooding during high water. Near the mouth the river enlarges into two lake-like expanses known as Cedar lake and Cross lake, from the latter lake the river flows into lake Winnipeg. Cross Lake rapids, Red Rock rapids and Grand rapids occur in this stretch of the river.

In Manitoba the river has an average width of one thousand feet, though above Grand rapids a minimum width of five hundred feet occurs. The river bottom above Cedar lake is composed of clay and gravel, below that point limestone ridges occur between which the bottom is covered with boulders. Valuable timber is to be found along the river at various points, but generally speaking, as the lake is approached, the growth becomes stunted, being for the most part second growth.

Above Grand rapids the river is navigable at certain stages and steamers have been operating as far upstream as Edmonton. At present all navigation below Pas is confined to gasoline launches and like small craft.

Considerable work in the way of reconnaissance and detailed surveys for various purposes has been done by the Dominion Water Power Branch in this part of the river, and in order to further the work, two metering stations have been established by the Manitoba Hydrometric Survey, one at Pas and the other at the head of Grand rapids.

LAKE WINNIPEG AT WINNIPEG BEACH.

HISTORY.

A gauge was set on lake Winnipeg at Winnipeg Beach on May 1, 1913, and records of daily gauge readings have been kept since that date.

LOCATION OF GAUGE.

A nine-foot vertical staff gauge is secured to the inner side of the C.P.R. pier. The gauge is referred to a B.M. of the Canadian Geodetic Survey set in the concrete base at the southeast corner of the C.P.R. water tank at the Winnipeg Beach station.

RECORDS AVAILABLE.

Records of daily gauge readings are available from May 1 to October 31, and at intervals during November and December of 1913, at intervals during January, February and March, and continuous from April 2 to December 31 in 1914, and continuous throughout the year of 1915.

LAKE MANITOBA AT DELTA.

HISTORY.

A gauge was installed on lake Manitoba at Delta on July 9, 1914, by C. O. Allen, and observations as to lake level have been made practically continuously since that time.

LOCATION OF GAUGE.

Delta is a small station on the C.N. Ry. located at the southerly end of lake Manitoba. The gauge installed at this point is a six-foot staff gauge secured to the piling of the breakwater, a short distance south of the bridge across the canal.

RECORDS AVAILABLE.

During the year 1914 daily gauge readings are available from June 12 to the 14th of November, and from the 7th of December to the end of the year. In 1915 the full year records are available.

SASKATCHEWAN RIVER AT PAS.

HISTORY.

The station on the Saskatchewan river at Pas was first established by W. G. Worden on October 21, 1912. On May 27, 1913, a new section at Pas was established by E. Bankson, and this station has been in operation since that date.

LOCATION OF SECTION.

The first section was located about one-quarter of a mile below the site of the Hudson's Bay Railway bridge at Pas. On May 27, 1913, this section was moved upstream to the downstream side of the H.B. Railway bridge. The I.P. is located on the handrail near the south end of the bridge on the downstream side, and is vertically above the river face of the south abutment. It is painted white and marked "0+00 I.P."

RECORDS AVAILABLE.

Records of daily gauge height were kept at various intervals from th early part of 1912 to the end of 1915. From October 21, 1912, to the end of 1915 the gauge heights are rather more continuous. Estimates of daily discharge have been computed for the periods covered by daily gauge heights from April 13, 1913, to the end of 1915.

DRAINAGE AREA.

The drainage area tributary to the Saskatchewan above Pas comprises the greater portion of Western Canada lying between parallels 49 and 54 north latitude and between the Rocky mountains and lake Winnipeg. The total area is 149,500 square miles.

GAUGE.

A twenty-foot vertical staff gauge has been fastened to the downstream side of the first pier from the south bank and 10 feet above the metering section. The gauge is referred to D.P.W. B.M. No. 79, which is a cross on a copper plug set on the west side of the south abutment of the H.B. Railway bridge, and is about three feet from the ground level. It is marked P.W.D. B.M. No. 79.

CHANNEL.

The river is divided by the bridge piers into six channels at low water and eight channels at high water. For 1,300 feet above and 2,700 feet below the section the channel is straight. The bed of the river is covered with gravel and small boulders, but at the section the stream bottom is somewhat shifting. The right bank is high and not liable to overflow, the left bank is low and liable to overflow at high stages. At extreme high water there is a small discharge through an overflow channel about 500 yards south of the bridge.

DISCHARGE MEASUREMENTS.

The discharge measurements were taken from a boat on the first section established. Since May, 1913, the meterings have been taken from the downstream side of the H.B. Ry. bridge.

ACCURACY.

The discharge curve for the station is well defined between gauge heights 818·5 and 822·7, between 822·7 and 828·0 the discharge curve exhibits all the characteristics which are peculiar to certain large rivers, in that the discharge for the same gauge height varies according as the river is on a rising or a falling stage. Above gauge height 627·0 and below 818·5 the discharge curve is fairly well defined.

DISCHARGE MEASUREMENTS OF SASKATCHEWAN RIVER AT PAS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per	Feet.	Sec.-ft.	
Jan. 12.	M. S. Madden...	1,462	759	8,929	0·50	15·86	4,467	Ice measurement. Winter section.
Feb. 4.	"	1,462	757	8,956	0·54	15·81	4,990	" "
Feb. 5.	"	1,462	757	8,922	0·58	15·83	5,220	" "
Feb. 6.	" ..	1,462	757	8,921	0·57	15·83	5,148	" "
Mar. 8.	" .	1,462	760	8,901	0·57	16·07	5,144	" "
Mar. 9.	" .	1,462	760	8,851	0·58	16·08	5,174	" "
April 2.	"	1,462	761	9,535	0·64	16·64	6,090	" "
April 29.	F. S. Smith......	1,186	746	13,970	2·31	21·91	32,316	Regular section.
April 30.	"	1,186	744	13,637	2·14	21·39	29,146	
June 4.	"	1,186	755	14,149	2·61	22·40	36,873	
June 12.	M. S. Madden...	1,462	760	15,266	2·73	23·59	41,690	
June 15.	"	1,462	767	15,858	3·07	24·33	48,753	
June 30.	C. O. Allen......	2,019	781	17,448	3·35	26·57	58,426	
July 1.	"	2,019	781	17,481	3·48	26·69	60,920	
July 9.	"	2,019	796	19,947	3·90	29·71	77,836	
July 10.	"	2,019	797	20,163	4·03	29·92	81,222	
July 12.	"	2,019	799	20,517	4·07	30·31	83,406	
July 14.	"	2,019	800	20,797	3·87	30·45	80,427	
July 15.	"	2,019	800	20,797	3·82	30·47	79,550	
July 16.	"	2,019	800	20,797	3·92	30·53	81,513	
July 17.	"	2,019	800	20,797	3·82	30·52	79,350	
July 19.	"	2,019	800	20,897	3·97	30·55	83,040	
July 20.	"	2,019	800	20,977	3·98	30·58	83,435	
July 21.	"	2,019	800	21,077	3·97	30·57	83,605	
July 22.	"	2,019	800	21,081	3·96	30·66	83,565	
July 23.	"	2,019	801	21,165	3·96	30·69	83,854	
July 26.	"	2,019	802	21,510	4·07	31·01	87,669	
July 27.	"	2,019	803	21,576	4·09	31·13	88,157	
July 28.	"	2,019	805	21,950	4·16	31·27	91,269	
July 29.	"	2,019	805	22,005	4·24	31·40	93,396	
July 31.	"	2,019	806	22,176	4·27	31·67	94,647	
Aug. 2.	"	2,019	810	22,531	4·38	31·89	98,562	
Aug. 3.	"	2,019	810	22,602	4·32	31·96	97,710	
Aug. 9.	"	2,019	810	22,664	4·32	32·09	97,997	
Aug. 10.	"	2,019	810	22,736	4·47	32·13	101,694	
Aug. 11.	"	2,019	810	22,751	4·38	32·11	99,745	
Aug. 12	"	2,019	810	22,774	4·33	32·11	98,536	
Aug. 13.	"	2,019	810	22,694	4·46	32·09	100,551	
Aug. 14.	"	2,019	810	22,694	4·40	32·07	99,885	
Aug. 16.	"	2,019	810	22,537	4·19	31·86	94,347	
Aug. 17.	"	2,019	810	22,536	4·14	31·88	93,269	
Aug. 18.	"	2,019	810	22,536	4·10	31·87	92,315	
Aug. 19.	"	2,019	810	22,531	4·09	31·84	92,300	
Aug. 20.	"	2,019	810	22,448	4·10	31·74	91,970	
Aug. 26.	"	2,019	806	21,843	3·86	31·10	84,306	
Aug. 28.	"	2,019	805	21,724	3·76	30·86	81,614	
Aug. 31.	"	2,019	799	21,338	3·60	30·28	76,761	
Sept. 1.	"	2,019	799	21,248	3·53	30·25	75,017	
Sept. 2.	" ...	14,819	799	21,248	3·65	30·20	77,557	
Sept. 3	"	2,019	799	21,141	3·67	30·16	77,486	
Sept. 4.	"	2,019	798	21,083	3·74	30·03	78,945	
Sept. 8.	"	2,019	796	20,792	3·53	29·61	73,366	
Sept. 10.	"	2,019	796	20,652	3·48	29·37	71,855	
Sept. 11.	"	2,019	795	20,589	3·42	29·23	70,518	
Sept. 13.	"	2,019	790	20,171	3·47	28·75	70,055	
Sept. 15.	"	2,019	788	19,869	3·44	28·32	68,344	
Sept. 16.	" ...	2,019	785	19,637	3·39	28·07	66,641	
Sept. 17.	"	2,019	784	19,467	3·36	27·80	65,417	
Sept. 18.	" ..	2,019	783	19,309	3·32	27·60	64,056	
Sept. 20.	" ..	2,019	780	18,857	3·18	27·15	59,889	
Sept. 22.	" .	2,019	779	18,515	3·10	26·67	57,435	
Sept. 23.	"	2,019	776	18,393	3·11	26·42	57,198	
Sept. 24.	"	2,019	775	18,162	2·99	26·14	54,309	

NOTE:—Add 800·00 to gauge heights to bring to station datum.

Daily Gauge Height and Discharge of Saskatchewan River at Pas, for 1915.

[Drainage area 149,500 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height,	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. tt.
1	15·95	....	15·65	4,745	16·02	5,226	16·60	5,980	21·55	30,645	22·50	35,050
2	15·85	....	15·75	4,875	16·04	5,252	16·65	6,045	21·50	30,420	22·52	35,146
3	15·75	....	15·81	4,953	16·02	5,226	16·65	6,045	21·35	29,750	22·60	35,530
4	15·75	....	15·83	4,979	16·01	5,213	16·65	6,045	21·35	29,750	22·75	36,255
5	15·65	....	15·83	4,979	16·03	5,239	16·85	6,305	21·30	29,530	22·84	36,696
6	15·70	....	15·83	4,979	16·10	5,230	16·95	6,435	21·05	28,445	22·90	36,990
7	15·72	....	15·87	5,031	16·05	5,265	17·00	6,500	20·95	28,020	22·97	37,333
8	15·75	....	15·89	5,057	16·07	5,291	17·05	6,565	20·95	28,020	23·00	37,480
9	15·75	....	15·89	5,507	16·08	5,304	17·05	6,565	20·83	27,416	23·10	37,980
10	[1]15·80	....	15·93	5,109	16·08	5,304	[1]18·50	7,000	20·47	26,007	23·12	38,080
11	[1]15·83	....	15·95	5,135	16·09	5,317	[1]20·10	8,000	19·99	24,060	23·14	38,180
12	[1]15·86	4,467	15·93	5,109	16·20	5,460	21·70	10,000	19·50	22,120	23·59	40,488
13	[1]15·95	....	15·95	5,135	16·25	5,525	[1]23·25	12,000	19·38	21,652	24·00	42,650
14	16·15	....	16·05	5,265	16·25	5,525	24·45	15,000	19·20	20,960	24·06	42,968
15	16·35	....	16·10	5,330	16·25	5,525	25·35	18,000	19·05	20,390	24·32	44,346
16	16·15	....	16·10	5,330	16·30	5,590	25·55	30,000	18·98	20,122	24·47	45,141
17	16·05	....	16·10	5,330	16·25	5,525	25·35	49,925	18·85	19,630	24·75	46,650
18	16·05	....	16·09	5,317	16·25	5,525	25.05	48,275	18·73	19,174	24·90	47,460
19	16·05	....	16·09	5,317	16·35	5,655	24·85	47,145	18·55	18,490	24·95	47,730
20	16·05	...	16·08	5,304	16·10	5,720	24·75	46,650	18·40	17,930	25·04	48,220
21	16·00	.	16·08	5,304	16·40	5,720	24·75	46,650	18·73	19,174	25·35	49,925
22	16·05	...	16·07	5,291	16·45	5,785	24·55	45,435	18·95	20,010	25·45	50,475
23	16·05	....	16·08	5,304	16·45	5,785	23·95	42,385	19·95	23,900	25·65	51,590
24	16·55	..	16·07	5,291	16·45	5,785	23·45	39,760	20·30	25,310	26·00	53,550
25	16·55	..	16·05	5,265	16·45	5,785	23·35	39,245	20·35	25,515	26·15	54,390
26	16·05		16·05	5,265	16·50	5,850	23·05	37,730	20·50	26,130	26·18	54,558
27	16·00		16·05	5,265	16·50	5,850	22·95	37,235	20·60	26,550	26·20	54,670
28	15·45		[1]16·03	5,239	16·50	5,850	22·85	36,475	20·65	26,760	26·27	55,062
29	15·45	..	......	..	16·55	5,915	21·91	32,286	20·75	27,180	26·47	56,182
30	15·47		....	...	16·55	5,915	21·75	31,550	21·85	32,010	26·50	56,350
31	15·47		....	....	16·60	5,980	....	....	21·86	32,056	......	....

Day.	July.		August.		September.		October.		November.		December.	
1	26·63	57,091	31·76	95,360	30·25	80,330	24·56	45,624	20·35	25,515	[1]16·80	...
2	26·86	58,452	31·88	96,936	30·19	79,863	24·48	45,194	20·24	25,064	[1]16·55	...
3	27·17	60,186	31·96	98.004	30·15	79,555	24·26	44,028	20·16	24,740	[1]16·30	...
4	27·60	62,680	32·01	98,676	30·03	78,638	24·04	42,862	20·04	24,260	16·15	
5	28·04	65,274	32·05	99,220	29·90	77,670	23·88	42,014	19·93	23,820	16·10	
6	28·48	68,032	32·07	99,492	29·81	77,013	23·57	40,384	19·86	23,540	16·00	
7	28·94	71,024	32·07	99,492	29·72	76,364	23·48	39,916	19·74	23,060	15.98	
8	29·30	73,440	32·08	99,628	29·61	75,581	23·40	39,500	19·58	22,432	16·01	
9	29·71	76,292	32·09	99,764	29·49	74,741	23·36	39,296	19·55	22,315	16·05	
10	29·93	77,892	32·13	100,137	29·35	73,780	23·03	37,630	[1]19·60	22,510	16·05	...
11	30·15	79,555	32·11	100,039	29·23	72,964	22·87	36,843	[1]19·65	22,705	16·25	
12	30·33	80,960	32·11	100,039	28·98	71,288	22·76	36,304	[1]19·75	23,100	16·55	.
13	30·41	81,602	32·09	99,764	28·75	69,775	22.67	35,866	[1]19·80	23.300	16·25	
14	30·45	81,930	32·06	99,356	28·51	68,224	22·48	34,954	[1]19·90	23,700	16·25	.
15	30·49	82,258	31·96	98,004	28·31	66,953	22·36	34,382	[1]19·95		16·17	..
16	30·53	82,592	31·87	96,804	29·05	65,335	22·24	33,818	[1]20·05		15·96	.....
17	30·53	82,592	31·88	96,936	27·80	63,840	21·99	32,654	[1]20·15		16·25	....
18	30·54	82,676	31·87	96,804	27·59	62,622	21·86	32,056	20·20		16·50	..
19	30·55	82,760	31·84	96,408	27·36	61,288	21·75	31,550	19·84		16·65	...
20	30·58	83,012	31·75	95,230	27·13	59,954	21·59	30,825	19·60		16·59	.
21	30·59	83,096	31·68	94,328	26·88	58,516	21·46	30,240	19·30		16·57	...
22	30·66	83,696	31·64	93,824	26·66	57,262	21·28	29,442	19·00	..	16·46	.
23	30·70	84,040	31·53	92,466	26·41	55,846	21·17	28,961	18·60		16·46	.
24	30·79	84,832	31·49	91,984	26·13	54,278	21·05	28,445	19·03		16·43	..
25	30·92	86,008	31·28	89,608	25·90	52,990	20·94	27,978	[1]18·90	.	16·42	...
26	30.99	86,666	31·10	87,740	25·56	51,086	20·66	26,802	[1]18·65		16·36	
27	31·14	88,148	30·99	86,666	25·45	50,175	20·25	25,105	[1]18·45	..	16·25	
28	31·27	89,502	30·86	85,460	25·15	48,825	20·67	26,844	[1]18·30		16·26	
29	31·43	91,288	30·66	83,696	24·95	47,730	20·71	27,012	[1]18·15		16·26	
30	31·56	92,832	30·50	82,340	24·83	47,082	20·45	25,925	[1]17·00		16·27	
31	31·68	94,328	30·30	80,720	......	....	20·45	25,925	17·00		16·27	....

Note.—Gauge heights marked thus (1) interpolated.
Ice conditions January 1 to April 16 and November 15 to December 31.
Not sufficient information to compute daily discharges.
Add 800·00 to gauge heights to bring to station datum.

MONTHLY DISCHARGE OF SASKATCHEWAN RIVER AT PAS, FOR SEASON 1915.
[Drainage area 149,500 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]4,500	0·030	0·035	276,700
February	5,330	4,745	5,163	0·034	0·033	286,700
March	5,980	5,213	5,556	0·037	0·043	341,600
April	49,925	5,980	24,583	0·164	0·183	1,462,800
May	32,056	17,930	25,069	0·168	0·194	1,537,500
June	56,350	35,050	44,904	0·300	0·335	2,672,000
July	94,328	57,091	79,185	0·530	0·611	4,868,900
August	100,317	80,720	94,697	0·633	0·730	5,822,700
September	80,330	47,082	65,329	0·437	0·487	3,887,400
October	45,624	25,105	34,141	0·228	0·263	2,099,200
November	....	....	[1]21,000	0·140	0·156	1,249,500
December	....	....	[1]7,000	0·047	0·054	430,400
The Year	100,317	4,745	32.519	0·229	3·124	24,935,400

NOTE.—Marked thus ([1]) estimated.

SASKATCHEWAN RIVER AT THE HEAD OF GRAND RAPIDS.

HISTORY.

This station was established by E.B. Patterson on July 31, 1912, and has been in continuous operation since that date.

LOCATION OF SECTION.

The meter section on the South Saskatchewan river at the head of Grand Rapids is located 640 feet below the Hudson's Bay Company's wharf, situated at the upper end of their tramway and 3,200 feet above the head of Grand Rapids. The I.P. is a hub at the top of the left bank. It is referenced to the end of a traverse line running from the Hudson's Bay Company tramway.

RECORDS AVAILABLE.

Intermittent records of daily gauge height extend over the period, August 3, 1912, to November 6, 1913, during the open water season. From November 7, 1913, to September 5, 1914, and from March 2 to December 31, 1915, a record of continuous gauge heights has been taken. Estimates of daily discharge have been prepared for the following periods:—August 1 to November 30, 1912, May 19 to November 11, 1913, April 23 to September 5, 1914, and from March 2 to December 31, 1915. Difficulty has been experienced in securing gauge height records during the winter months.

DRAINAGE AREA.

The drainage area of the Saskatchewan river above the head of Grand Rapids is 155,100 square miles.

GAUGE.

A nine-foot vertical staff gauge has been placed at the end of the section and fastened to a crib which acts as a retaining wall for the bank. Prior to this gauge being placed, one was secured to the dock of the Hudson's Bay Co., about 500 feet above the section, and it is to this gauge that the records given are referred.

CHANNEL.

For 800 feet above and 500 feet below the section the channel is straight. The hydraulic gradient for this section is quite perceptible. The river is confined to one channel at all stages, the bed of the stream is of sand and gravel and fairly permanent. The banks are high, covered with scrub and are not liable to overflow.

DISCHARGE MEASUREMENTS.

Discharge measurements in open water seasons are made from a boat located on the section by range poles, the distances between stations being determined by stadia or triangulation.

ACCURACY.

The discharge curve is only fairly well defined between the extreme limits of gauge heights which are 786·0 and 789·4. Owing to the hydraulic gradient the section may be considered an open water one, as very little ice forms at this point during the winter season.

Discharge Measurements of Saskatchewan River at Grand Rapids, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 4...	E. B. Patterson...	1,196	979	10,605	0·66	85·09	**6,999**[1]
5...	"	1,196	979	10,712	0·65	85·12	**6,963**[1]
6...	"	1,196	979	10,575	0·73	85·04	**7,720**[1]
Sept. 18...	W. E. Weld........	1,940	1,068	17,268	4·42	89·69	**76,367**
Oct. 12...	"	1,940	1,059	15,546	3·50	88·07	**54,397**

[1] Ice measurement.

DAILY GAUGE HEIGHT AND DISCHARGE OF SASKATCHEWAN RIVER AT GRAND RAPIDS, FOR 1915.

[Drainage area 155,100 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	....	....	....	....	....	....	3·25	5,660	5·67	19,866	5·43	17,682
2	....	....	....	....	5.28	7,432	3·23	5,690	5·68	19,964	5·47	17,978
3	....	....	....	....	5·25	7,360	3·18	5,808	5·75	20,650	5.50	18,200
4	....	....	....	....	5·09	7,000	3·40	5,872	5·86	21,728	5·53	18,494
5	....	....	....	....	5·12	7,024	3·64	5,936	5·88	21,924	5·88	21,924
6	....	....	....	....	5·04	6,906	3·71	6,000	5·89	22,022	5·83	21,434
7	....	....	....	....	5·09	6,976	3·75	6,064	5·91	22,018	5·80	21,140
8	....	....	....	....	4·84	6,808	3·83	6,128	5·90	22,120	5·76	20,928
9	....	....	....	....	4·79	6,640	3·77	6,192	5·93	22,414	5·79	21,042
10	....	....	....	....	4·82	6,688	3·80	6,384	5·80	21,140	5·82	21,336
11	....	....	....	....	4·41	5,936	3·78	6,664	5·63	19,474	5·87	21,826
12	....	....	....	....	4·30	5,600	3·82	6,952	5·54	18,952	6·00	23,100
13	....	....	....	....	4·17	5,470	3·87	7,240	5·51	18,298	6·06	23,820
14	....	....	....	....	4·06	5,360	3·90	7,528	5·62	19,376	6·10	24,300
15	....	....	....	....	3·85	5,150	4·08	7,096	5·53	18,494	6·29	25,500
16	....	....	....	....	3·78	5,080	4·17	8,314	5·45	17,830	6·17	25,140
17	....	....	....	....	3·77	5,070	4·30	8,722	5·49	18,156	6·20	25,500
18	....	....	....	....	3·83	5,130	4·35	9,130	5·46	17,904	6·13	24,660
19	....	....	....	....	3·78	5,080	4·29	9,622	5·47	17,978	6·18	25,260
20	....	....	....	....	3·80	5,200	4·33	10,174	5·45	17,830	6·15	24,900
21	....	....	....	....	3·82	5,240	4·30	10,680	5·45	17,830	6·30	26,700
22	....	....	....	....	3·83	5,220	4·53	11,774	5·41	17,534	6·47	28,740
23	....	....	....	....	3·80	5,300	4·70	12,760	5·28	16,572	6·55	29,830
24	....	....	....	....	3·78	5,340	4·94	14,152	5·34	17,016	6·57	30,122
25	....	....	....	....	3·67	5,380	5·13	15.462	5·30	16,720	6·66	31,436
26	....	....	....	....	3·61	5,420	5·24	16,276	5·32	16,868	6·78	23,188
27	....	....	....	....	3·54	5,460	5·40	17,460	5·30	16,720	6·83	33,918
28	....	....	....	....	3·50	5,500	5·69	20,062	5·28	16,572	6·91	35,086
29	....	....	....	....	3·41	5,540	5·70	20,160	5·35	17,090	6·99	36,254
30	....	....	....	....	3·33	5,580	5·73	20,454	5·39	17,416	6·13	38,298
31	....	....	....	....	3·30	5,620	....	....	5·50	18,200	....	....

Day.	July.		August.		September.		October.		November.		December.	
1	7·20	39,320	9·07	66,622	9·80	72,280	8·98	65,308	6·61	30,706	6·14	....
2	7·25	40,050	9·09	66,914	9·91	78,886	8·95	64,780	6·60	30,560	6·01	....
3	7·29	40,634	9·10	67,060	9·99	80,054	8·89	63,994	6·47	28,740	6·38	....
4	7·31	40,926	9·05	66,330	10·00	80,200	8·80	62,680	6·39	27,780	6·41	....
5	7·36	41,656	9·21	68,666	10·04	80,784	8·77	62,242	6·35	27,300	6·43	....
6	7·42	42,532	9·27	69,542	9·98	79,908	8·51	58,446	6·36	27,420	5·79	....
7	7·49	43,554	9·30	69,980	10·02	80,492	9·46	57,722	6·33	27,060	5·63	....
8	7·53	44,038	9·33	70,418	10·09	81,514	9·40	56,840	6·26	26,220	4·97	....
9	7·61	45,306	9·38	71,148	10·13	82,098	9·28	55,088	6·08	24,060	5·90	....
10	7·65	45,890	9·42	71,732	10·15	82,390	9·23	54,358	5·95	22,610	5·63	....
11	7·80	48,080	9·47	72,462	10·19	82,974	8·20	53,920	5·99	21,434	5·71	....
12	7·91	49,686	9·53	73,338	10·21	83,266	8·09	52,314	6·10	20,258	5·32	....
13	8·03	51,438	9·58	74,068	9·87	78.302	7·99	50,854	5·59	19,090	5·25	....
14	7·99	50,854	9·61	74,506	9·75	76,550	7·82	48,372	5·72	18,690	5·22	....
15	8·02	51,292	9·52	73,192	9·71	76,404	7·77	47,642	5·95	18,298	6·05	....
16	8·11	52,606	9·50	72,900	9·70	75,820	7·72	46,912	6·30	17,534	5·70	....
17	8·19	53,774	9·55	73,630	9·65	75,090	7·64	45,744	6·30	17,608	5·77	....
18	8·32	55,672	9·63	74,798	9·69	75,674	7·58	44,768	6·61	17,312	5·83	....
19	8·40	56,840	9·76	76,696	9·63	74,798	7·60	45,160	5·92	17,016	5·90	....
20	8·61	59,906	9·79	77,134	9·58	74,068	7·71	46,766	5·30	16,720	6·10	....
21	8·67	60,782	9·84	77,864	9·55	73,630	7·45	42,970	5·57	16,646	5·85	....
22	8·72	61,512	9·89	78,954	9·47	72,462	7·17	38,882	6·05	16,498	6·03	....
23	8·68	60,928	9·95	79,470	9·42	71,732	6·96	35,816	6·34	16,424	6·15	....
24	8·70	61,220	10·00	80,200	9·25	69,250	6·99	36,254	6·49	16,286	6·13	....
25	8·79	62,534	9·93	79,178	9·19	68,374	6·93	35,378	6·81	16,202	6·23	....
26	8·91	64,286	9·80	77,280	9·15	67,790	6·97	35,962	6·88	16,054	6·15	....
27	8·95	64,870	9·95	79,470	9·10	67,060	6·84	34,064	5·55	15,980	6·29	....
28	8·99	65,454	10·03	80,638	9·14	67,644	6·88	34,648	5·63	15,832	6·25	....
29	9·01	65,746	9·98	79,908	9·09	66,914	6·79	33,344	5·80	15,758	6·27	....
30	9·10	67,060	9·89	78,594	9·07	66,622	6·71	32,166	6·05	15,610	6·55	....
31	9·05	66,330	9·76	76,696	....	....	6·63	30,998	....	....	6·53	....

Ice conditions from January 1 to April 29 and November 10 to December 31

MONTHLY DISCHARGE OF SASKATCHEWAN RIVER AT GRAND RAPIDS FOR 1915.

[Drainage area 155,100 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]4,500	0·029	0·033	276,700
February	....	....	[1]5,000	0·032	0·033	277,700
March	....	5,080	5,850	0·038	0·044	359,700
April	20,454	5,660	10,041	0·065	0·073	597,500
May	22,414	16,572	18,913	0·122	0·141	1,162,900
June	38,298	17,682	25,621	0·165	0·184	1,524,600
July	67,060	39,320	53,380	0·344	0·397	3,282,200
August	80,638	66,330	74,162	0·478	0·551	4,560,000
September	83,266	66,622	75,601	0·487	0·543	4,499,100
October	65,308	30,998	47,563	0·307	0·354	2,924,600
November	30,706	15,610	20,590	0·133	0·148	1,225,200
December	....	....	[1]8,000	0·052	0·060	491,900
The Year	83,266	....	29,102	0·188	2·561	21,182,100

NOTE.—Marked thus(1) estimated.

FAIRFORD RIVER.

The Fairford river forms the outlet of lake Manitoba. It empties into lake St. Martin, which in turn is drained by the Dauphin river. The Fairford river is quite short, a lake-like expanse known as lake Pinemuta occurring between lake Manitoba and lake St. Martin.

Lake Manitoba, which has an area of 1,711 square miles, forms the basin into which practically all the territory, lying between the Assiniboine and the Saskatchewan rivers and to the east of the Riding, Duck and Porcupine mountains, drains. The soil is generally clay and suitable to agriculture. A considerable proportion of the area is timbered and in certain sections rock outcrops occur. Numerous lakes are also to be found; among these are lake Winnipegosis, lake Dauphin, Red Deer lake, Swan lake and many others varying in size from mere ponds to lakes of the size mentioned.

The banks of the Fairford river vary from three to ten feet in height. At the upper or lake Manitoba end they are well defined, gradually flattening out below Fairford until they open out into wide, low lying marshy ground in the vicinity of lake Pinemuta. Below this lake they are somewhat higher but again change until they merge with the low swampy shores of lake St. Martin.

The Fairford river varies in width from 500 to 900 feet and at two points, one about one half mile below the outlet of lake Manitoba, flows over a low limestone ridge or bar.

Some surveys of the river have been made by the Department of Public Works, with a view to improving it for navigation purposes. In addition to this a water power reconnaissance survey was made in 1913 by the Manitoba Hydrometric Survey.

FAIRFORD RIVER AT FAIRFORD.

HISTORY.

This station was established by G. H. Burnham on June 27, 1912, and has been in continuous operation since that date.

LOCATION OF SECTION.

The metering section is located on the downstream side of the C.N.R. bridge, which crosses the Fairford river at Fairford and is 2½ miles below lake Manitoba. The I.P. is located on the north abutment of the bridge on the downstream side.

RECORDS AVAILABLE.

Records of daily gauge height have been obtained from June 27, 1912, till the end of December, 1915. A number of meterings have been taken during the same period. Owing to the change in slope due to rising and falling of lake Manitoba caused by the wind, it has not been possible to define a discharge curve for the station.

DRAINAGE AREA.

The area tributary to the Fairford river above this station includes the total drainage area of lake Manitoba and lake Winnipegosis, and is 31,900 square miles.

GAUGE.

A six-foot vertical staff enamelled gauge is fastened to the first bridge pier from the left bank and is referred to C.N.R. datum.

CHANNEL.

The channel is straight for 400 feet above and 500 feet below the section. It was originally divided by the fifteen bridge piers into sixteen sections at all stages. In 1914 the bridge was replaced by a steel structure resting upon piers which divided the channel into four sections, the old pile bents being removed. The bed of the stream is gravel and not subject to shifting. The banks are high though subject to overflow at high stages.

DISCHARGE MEASUREMENTS.

The meterings are made from the downstream side of the C.N.R. bridge, the station being an open water station the year around.

ACCURACY.

Owing to the wind effect on lake Manitoba and the consequent range in stage and its effect upon the slope of the river, it has not been possible to define a discharge curve for this section.

Discharge Measurements of Fairford River at Fairford, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 12...	C. O. Allen	1,912	243	1,739	2·19	802·44	3,824
7...	"	1,912	221	1,503	1·95	801·76	2,925
8...	"	1,912	221	1,501	2·03	801·78	3,041
9...	"	1,912	221	1,501	1·95	801·79	2,919
May 10.	T. J. Moore....	1,197	223	1,434	1·90	801·51	2,726

TRIBUTARIES OF LAKE WINNIPEG FROM THE EAST.

GENERAL.

The rivers of importance entering lake Winnipeg from the east are:—
Brokenhead,
Winnipeg,
Manigotagan,
Bloodvein,
Pigeon,
Berens.

These tributaries drain the territory to the west of the watershed of the Great Lakes and Hudson's Bay. Practically all of this country is unsurveyed, so that it is not possible to delimit accurately their actual drainage basins. Practically all the drainage area lies in the Laurentian formation, small lakes and ponds abound and a considerable portion of the surface is covered by muskeg. The rivers are generally in the nature of a series of pools or small lake-like expanses, connected by short narrow channels which are interrupted by falls and rapids. Small stands of merchantable timber are to be found throughout the district, being composed of spruce, jack pine, poplar and birch.

Of the above rivers the Winnipeg is dealt with separately, and of the remainder, continuous records of discharge are available for the Brokenhead and Manigotagan; for the Berens and Pigeon rivers, individual meterings have been obtained.

BROKENHEAD RIVER.

The drainage basin of the Brokenhead river lies in the narrow strip of country between the basin of the Winnipeg and Whitemouth rivers on the east and of the Red river on the west. The river flows northwesterly and empties into lake Winnipeg.

The drainage area is 910 square miles, the basin being 22 miles in width at the widest point and apprxoimately 75 miles long. The greater portion is low lying and empty, though at the lower end part has been placed under cultivation by the aid of drainage work. The whole area can be reclaimed.

The banks are low and the stream bed is of clay, with boulders occurring in some sections

BROKENHEAD RIVER AT SINNOT.

HISTORY.

The station on the Brokenhead at Sinnot was established by G. H. Burnham on May 30, 1912.

LOCATION OF SECTION.

The section is located on the downstream side of the traffic bridge and is nine hundred feet northeast of the C.P.R. station at Sinnot. The I.P. is marked by a group of nails driven into the floor of the bridge on the downstream side and vertically above the face of the south abutment.

RECORDS AVAILABLE.

Records of daily gauge height have been secured for the periods June 8 to November 30, 1912, April 29 to November 30, 1913, and April 13 to December 31, 1914, and from January 1 to December 31, 1915. A number of meterings have also been secured and estimates of daily discharge have been prepared for the above periods, with the exception of the winter periods of 1915, when sufficient information is not available to allow the estimating of daily discharges.

DRAINAGE AREA.

The drainage area tributary to the Brokenhead above Sinnot is 530 square miles.

Taken by M. S. Madden.

Brokenhead River—Sinnot—Station and I.P. from Below, Right Bank.

GAUGE.

A vertical staff gauge is secured to a pile of the bridge opposite station 12.5 on the meter section. This gauge is referred to a permanent M.H.S. B.M. located twenty-three feet southwest of I.P. on the section. This B.M. is set to an arbitrary datum.

CHANNEL.

For three hundred feet above and three hundred feet below the meter section the channel is straight. The river is confined to the channel at all stages but is divided into four sections by the three pile bents supporting the bridge. The bed of the stream is of gravel and boulders, and permanent. The banks are fairly high and comparatively free from overflow.

DISCHARGE MEASUREMENTS.

The discharge measurements are made from the downstream side of the traffic bridge.

ACCURACY.

For the open water season the discharge curve is well defined between gauge heights 91·2 and 92·5, between gauge heights 92·5 and 94·2 the curve is fairly well defined. For winter conditions a fairly well defined curve has been obtained for the range in gauge height 89·8 to 91·0.

DISCHARGE MEASUREMENTS OF BROKENHEAD RIVER AT SINNOT, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 19...	C. O. Allen....	1,912	65·0	29·8	0·26	90·86	7·8[1]
Mar. 18...	"	1,912	25·0	7·5	0·32	91·19	2·4[1]
April 15...	M. S. Madden..	1,462	83·5	232·3	1·18	92·43	274·5
May 5...	C. O. Allen...	2,018	87·5	341·7	1·58	93·65	539·9
May 12...	M. S. Madden..	1,462	87·5	387·5	2·00	94·03	774·9
June 2...	" ...	1,462	78·0	178·4	0·84	91·96	151·2
June 22..	C. O. Allen....	2,018	82·8	221·2	1·04	92·53	230·0
July 14...	T. H. Boyd....	1,197	79·0	163·0	0·71	91·76	115·7
Aug. 5...	H. H. Pratt.....	1,496	76·0	122·4	0·28	90·95	34·1
Aug. 11..	" .	1,496	71·3	83·4	0·17	90·71	14·6
Aug. 17...	" .	1,496	69·5	75·2	0·09	90·55	6·4
Aug. 17...	" ..	1,496	39·0	27·4	0·22	90·55	6·1[2]
Aug. 21...	"	1,496	33·7	24·9	0·13	90·41	3·3[2]
Aug. 21 .	"	1,496	65·6	60·9	0·03	90·41	2·0[3]

[1] Ice measurement.

[2] Below regular section.

[3] Regular section.

DAILY GAUGE HEIGHT AND DISCHARGE OF BROKENHEAD RIVER AT SINNOT FOR 1915.

[Drainage area 530 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	90·93	.....	91·41	....	90·92	....	91·55	....	93·95	735	92·08	169
2	90·90	......	91·43	....	90·90	...	91·65	....	93·85	690	91·97	151
3	90·90	....	91·43	....	90·88	.	91·82	....	93·83	681	91·91	142
4	90·89	..	91·48	......	90·87	.	92·50	......	93·76	651	91·82	129
5	90·89	.	91·48	.....	90·87		92·94	.....	93·66	610	91·80	126
6	90·89	.....	91·28	....	90·86	.	93·36	....	93·60	586	91·83	130
7	90·88	....	91·28	......	90·86		93·47	......	93·74	643	91·77	122
8	90·88	..	91·23	.....	90·88		94·24	......	93·90	712	91·84	132
9	90·88	...	91·23	.....	90·90		94·32	......	94·09	801	92·02	159
10	90·88	....	91·18	......	90·92		93·86	.....	94·13	821	92·23	194
11	90·88	....	91·16	....	90·95		92·96	365	94·17	841	92·50	247
12	90·87	....	91·16	....	90·98		92·75	308	94·05	782	92·56	261
13	90·87	....	91·17	.....	91·08	.	92·73	303	93·96	740	92·60	270
14	90·87	......	91·15	....	91·08		92·58	265	93·85	690	92·67	288
15	90·86	....	91·08	.....	91·08		92·45	237	93·74	643	92·70	295
16	90·86	..	91·03	....	91·12		92·36	218	93·62	594	92·67	288
17	90·86	......	90·98	.....	91·17		92·30	207	93·64	602	92·64	280
18	90·80	.....	91·06	.....	91·17	2	92·26	200	93·35	493	92·62	275
19	90·75	8	91·07	.....	91·13	..	92·24	196	93·18	434	92·61	273
20	90·73	......	91·03	......	91·09		92·23	194	93·10	408	92·60	270
21	90·73	.....	91·03	.....	91·05	.	92·22	193	93·03	386	92·57	263
22	90·73	.....	90·98	.....	91·04	..	92·22	193	92·93	357	92·52	252
23	90·73	...	90·96	....	91·23		92·35	217	92·86	337	92·51	249
24	90·72	..	90·95	......	91·46	..	92·70	295	92·75	308	92·32	211
25	90·72	.....	90·98	.....	91·76	...	93·46	532	92·67	288	92·55	259
26	90·76	......	90·96	.....	91·77	..	93·77	655	92·56	261	92·62	275
27	90·88	....	90·93	.....	91·65	.	93·95	735	92·48	243	92·70	295
28	91·03	......	90·92	...	91·61	.	94·09	801	92·40	226	92·69	293
29	91·17	......	....	.....	91·47	..	94·04	777	92·34	215	92·62	275
30	91·27	......	....	......	91·43	..	94·00	758	92·24	196	92·52	252
31	91·40	......	....	....	91·47	...	....	....	92·15	181	.....	....

Day.	July.		August.		September		October.		November.		December	
1	92·44	234	91·16	51	90·34	2	90·95	32	91·21	56	91·09	....
2	92·32	211	91·10	45	90·34	2	90·97	33	91·16	51	91·05	...
3	92·22	193	91·04	40	90·33	2	91·16	51	91·11	46	91·05	..
4	92·16	182	90·97	33	90·33	2	91·21	56	91·08	43	91·01	.
5	92·00	156	90·95	32	90·33	2	91·25	60	91·07	42	90·98	
6	91·92	143	90·90	27	90·33	2	91·30	65	91·06	41	90·95	..
7	91·86	134	90·86	24	90·32	2	91·43	60	91·11	46	90·95	..
8	91·82	129	90·81	21	90·40	3	91·46	83	91·15	50	90·94	.
9	91·81	127	90·77	18	90·37	3	91·51	89	91·19	54	90·91	..
10	91·81	127	90·75	17	90·37	3	91·56	95	91·41	.	90·89	.
11	91·77	122	90·71	15	90·36	3	91·55	94	91·58		90·89	
12	91·72	116	90·66	12	90·36	3	91·53	92	91·58	..	90·89	
13	91·72	116	90·64	11	90·37	3	91·52	90	91·60	....	90·88	
14	91·77	122	90·60	9	90·38	3	91·13	80	91·63		90·86	
15	91·68	110	90·57	8	90·41	3	91·37	73	91·58	.	90·86	
16	91·76	121	90·56	8	90·39	3	91·35	71	91·55		90·85	
17	91·94	146	90·55	8	90·38	3	91·30	65	91·52		90·84	
18	91·86	134	90·54	7	90·37	3	91·27	62	91·48		90·83	
19	91·85	133	90·53	7	90·37	3	91·26	61	91·38		90·76	
20	91·78	123	90·51	6	90·38	3	91·25	60	91·35		90·75	
21	91·74	118	90·47	5	90·41	3	91·23	58	91·31		90·72	
22	91·71	118	90·46	5	90·39	3	91·20	55	91·29		90·72	
23	91·75	120	90·46	5	90·38	3	91·18	53	91·25		90·73	
24	91·69	112	90·45	5	90·38	3	91·15	50	91·21		90·73	
25	91·66	108	90·44	4	90·53	7	91·16	51	91·18		90·73	
26	91·62	103	90·43	4	90·58	8	91·19	54	91·17		90·73	
27	91·56	95	90·42	4	90·58	8	91·24	59	91·17		90·74	
28	91·47	84	90·39	3	90·57	8	91·26	61	91·16		90·72	
29	91·46	83	90·36	3	90·64	11	91·26	61	91·16		90·72	
30	91·27	62	90·35	3	90·89	26	91·27	62	94·11	.	90·72	
31	91·20	55	90·31	2	.....	.	91·25	60	.....	..	90·72	

NOTE.—Ice conditions from January 1 to April 10 and November 10 to December 31
Information insufficient to compute daily discharges

MONTHLY DISCHARGE OF BROKENHEAD RIVER AT SINNOT FOR THE YEAR 1915.

[Drainage area 530 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	...	...	[1]6	0·011	0·013	369
February	...	...	[1]4	0·008	0·008	222
March	...	...	[1]3	0·006	0·007	184
April	...	...	[1]285	0·538	0·600	17,000
May	841	181	521	0·983	1·133	32,000
June	295	122	227	0·428	0·477	13,500
July	234	55	127	0·240	0·277	7,800
August	51	2	14	0·026	0·030	860
September	26	2	4	0·008	0·009	238
October	95	32	65	0·123	0·142	4,000
November	...	...	[1]40	0·076	0·085	2,380
December	...	...	[1]15	0·028	0·032	922
The Year	841	[1]0	109	0·206	2·813	79,475

NOTE.—Marked thus (1) estimated.

MANIGOTAGAN RIVER.

The Manigotagan river, also known as the Bad Throat river, empties into lake Winnipeg from the east about fifty miles north of Fort Alexander. The drainage area is approximately three hundred square miles, though it cannot be definitely determined, as the river lies almost entirely in unsurveyed territory. The general course of the river from source to mouth is northwest. There are a number of lake-like expanses in the river between Long lake and Turtle lake, these are known as Caribou, Musk Rat, Moose and Bull Frog lakes.

At the mouth of the river the land is adapted to agriculture, being good clay land. Above Wood falls the country changes and rock outcrops occur; these form barriers across the river, causing falls or rapids; between these the banks are high and rocky, or low, with valleys leading back into muskegs.

The river above Wood falls, for a distance of twenty-five miles has an average width of 175 feet. Above this point it is a series of small lake-like expanses or pools of several hundred feet in width joined by narrow stretches, which in the majority of cases are broken by falls or rapids.

The entire drainage area is more or less covered with timber growth; this is not of merchantable size and is of inferior quality, consisting of spruce, scrub oak, birch and poplar. In the upper part a fringe of good spruce timber is to be found bordering the lakes.

In 1913 a reconnaissance survey of the power possibilities of the river was made by a party sent out by the Manitoba Hydrometric Survey.

MANIGOTAGAN RIVER AT WOOD FALLS.

HISTORY.

The station on the Manigotagan was estabished on December 21, 1912, by G. J. Lamb, and has been operated since that date.

LOCATION OF SECTION.

The meter section is located two hundred feet above the first falls, known as Wood falls. It is about one mile northeast of the Manigotagan post office and three miles from the large island at the mouth of the river. The I.P. is marked by a spike driven into a 12-inch tree which is blazed and stands near the water's edge on the left bank.

RECORDS AVAILABLE.

A record of daily gauge height has been secured for the periods April 19 to October 31, 1913, April 18 to November 15, 1914, and from December 12, 1914, to December 31, 1915. Estimates of daily discharge have been computed for the same period, with the exception of periods of ice cover conditions, during which periods the information at hand is not sufficient to allow the computation of daily discharges.

DRAINAGE AREA.

The drainage area tributary to the Manigotagan above the section is 375 square miles.

GAUGE.

Two gauges are in operation at this point. The first is a three-foot vertical staff enamelled gauge fastened to a two by four inch scantling which is driven into the river bed 135 feet below the meter section and in a small bay near the right bank above the falls. The second is a three foot vertical staff enamelled gauge fastened to a two by four inch scantling which is secured to the perpendicular rock face on the right shore one hundred feet below and facing Wood falls. Both gauges are referred to a B.M. which is located on a horizontal ledge of rock ten feet from the gauge below the falls, and is marked by means of paint on the rock face, "W.P.S. B.M."

CHANNEL.

The river occupies one channel at all stages, it is straight for three hundred feet above and one hundred feet below the section. The banks are high and wooded and not liable to overflow.

DISCHARGE MEASUREMENTS.

Discharge measurements have been taken at this point by means of a canoe kept on the section line with the aid of a tagged line stretched across the river.

ACCURACY.

On account of the small number of discharge measurements taken at this point the discharge curve is not well defined.

DISCHARGE MEASUREMENTS OF MANIGOTAGAN RIVER ABOVE WOOD FALLS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet.	Sec. ft.
Mar. 10	C. O. Allen	1,912	42	59·1	0·86	729·73	50·8[1]

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[1] Ice measurement.

Daily Gauge Height and Discharge of Manigotagan River above Wood Falls, for 1915.

[Drainage area 375 square miles.]

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec. ft.	Feet	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.	Feet.	Sec. ft.
1	730·05		729·75		729·75		729·65		732·15	1,066	731·15	626
2	730·05		729·75		729·75		729·65		732·10	1,044	731·15	626
3	730·05		729·75		729·75		729·70		732·05	1,022	731·15	626
4	730·00		729·75		729·75		729·75		732·05	1,022	731·15	626
5	730·00		729·75		729·75		729·80		732·00	1,000	731·15	626
6	730·00		729·75		729·75		729·85		731·95	978	731·15	626
7	730·00		729·75		729·75		729·90		731·90	956	731·10	604
8	730·00		729·75		729·75		729·95		731·75	890	731·10	604
9	729·95		729·75		729·75		730·00		731·70	868	731·10	604
10	729·95		729·75		729·75		730·05		731·65	846	731·10	604
11	729·95		729·75		729·75		730·10		731·60	824	730·95	538
12	729·95		729·75		729·75		730·25		731·55	802	731·95	538
13	729·95		729·75		729·75		730·35		731·55	802	731·95	538
14	729·95		729·75		729·75		730·45		731·45	758	731·95	538
15	729·95		729·75		729·75		730·55	362	731·45	758	731·90	516
16	729·95		729·75		729·75		730·65	406	731·45	758	731·90	516
17	729·95		729·75		729·75		730·75	450	731·45	758	731·90	516
18	729·95		729·75		729·75		730·85	494	731·45	758	731·90	516
19	729·90		729·75		729·75		730·95	538	731·40	736	731·90	516
20	729·90		729·75		729·75		731·25	670	731·40	736	731·75	450
21	729·85		729·75		729·75		731·25	670	731·40	736	731·75	450
22	729·85		729·75		729·70		731·25	670	731·35	714	731·75	450
23	729·85		729·75		729·70		731·25	670	731·35	714	731·70	428
24	729·85		729·75		729·70		731·55	802	731·35	714	731·70	428
25	729·85		729·75		729·70		731·65	846	731·35	714	731·70	428
26	729·85		729·75		729·70		731·80	912	731·35	714	731·55	362
27	729·85		729·75		729·70		732·05	1,022	731·30	692	731·55	362
28	729·80		729·75		729·65		732·25	1,110	731·30	692	731·55	362
29	729·80		.....		729·65		732·25	1,110	731·30	692	731·50	340
30	729·80		....		729·65		732·20	1,088	731·30	692	731·50	340
31	729·80		....		729·65		......		731·30	692	.....	....

	July.		August.		September.		October.		November.		December.	
1	730·50	340	729·90	153	729·75	130	729·90	153	730·40	296	731·05	350
2	730·50	340	729·90	153	729·70	123	729·90	153	730·45	318	731·05	
3	730·50	340	729·85	145	729·70	123	729·95	162	730·50	340	731·05	
4	730·45	318	729·85	145	729·70	123	729·95	162	730·50	340	731·05	
5	730·45	318	729·85	115	729·70	123	730·00	171	730·50	340	731·05	
6	730·45	318	729·85	145	729·65	117	730·00	171	730·50	340	731·05	
7	730·45	318	729·85	145	729·65	117	730·05	182	730·55	362	731·05	
8	730·40	296	729·80	137	729·65	117	730·05	182	730·55	362	731·05	
9	730·40	296	729·80	137	729·65	117	730·05	182	730·75	450	731·05	
10	730·40	296	729·80	137	729·60	111	730·10	193	730·80	472	731·00	
11	730·40	296	729·80	137	729·60	111	730·10	193	730·80	472	731·00	
12	730·35	274	729·80	137	729·60	111	730·10	193	730·85	494	731·00	
13	730·35	274	729·75	139	729·60	111	730·15	206	730·85	494	731·00	
14	730·35	274	729·75	130	729·65	117	730·15	206	730·85	494	731·00	
15	730·35	274	729·75	130	729·65	117	730·15	206	730·85	494	731·00	270
16	730·35	274	729·75	130	729·65	117	730·20	220	730·90		731·00	
17	730·35	274	729·75	130	729·65	117	730·20	220	730·90		730·95	
18	730·35	274	729·70	123	729·70	123	730·20	220	730·90		730·95	
19	730·30	252	729·70	123	729·70	123	730·20	220	730·95		730·95	
20	730·30	252	729·70	123	729·70	123	730·25	236	730·95		730·95	
21	730·20	220	729·70	123	729·70	123	730·25	236	730·95		730·95	
22	730·20	220	729·70	123	729·75	130	730·25	236	730·95		730·95	
23	730·15	206	729·80	137	729·75	130	730·30	252	731·00		730·95	
24	730·15	206	729·80	137	729·75	130	730·30	252	731·00		730·95	
25	730·15	206	729·80	137	729·80	137	730·30	252	731·00		730·95	
26	730·10	193	729·85	145	729·80	137	730·30	252	731·05		730·95	
27	730·10	193	729·85	145	729·80	137	730·35	274	731·05		730·95	
28	729·95	162	729·70	123	729·80	137	730·35	274	731·05		730·95	
29	729·95	162	729·80	137	729·85	145	730·35	274	731·05		730·95	
30	729·95	162	729·80	137	729·85	145	730·40	296	731·05		730·95	
31	729·90	153	729·80	137		.....	730·40	296	....		730·95	130

Note.—Ice conditions from January 1 to April 14 and November 16 to December 31. Information insufficient to compute daily discharges.

MONTHLY DISCHARGE OF MANIGOTAGAN RIVER ABOVE WOOD FALLS, FOR THE YEAR 1915.
[Drainage area 375 square miles.]

MONTH.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage Area.	Total in acre-feet.
January	....	....	[1]50	0·133	0·153	3,000
February	....	....	[1]50	0·133	0·139	2,800
March	....	51	[1]50	0·133	0·153	3,000
April	1,110	....	[1]470	1·253	1·398	28,000
May	1,066	692	811	2·163	2·494	49,900
June	626	340	510	1·360	1·517	30,300
July	340	153	257	0·685	0·790	15,800
August	153	123	136	0·363	0·419	8,400
September	145	111	124	0·331	0·369	7,400
October	296	153	217	0·579	0·668	13,300
November	....	....	[1]360	0·960	1·071	21,400
December	....	....	[1]180	0·480	0·553	11,100
The Year	1,110	50	268	0·714	9·724	194,400

NOTE.—Marked thus ([1]) estimated.

BERENS RIVER.

The Berens river enters lake Winnipeg from the east, about one hundred and forty miles north of Fort Alexander. It is the most important tributary of the lake entering from the east, with the exception of the Winnipeg river. It has a drainage area estimated to be 7,800 square miles and a length of approximately 300 miles. The headwaters lie near the height of land which forms the south and west limits of the Severn and Albany drainage basins. Many lakes are to be found in the district, though their areas are not well defined, as they are in unsurveyed territory.

The country drained is typical of the Laurentian formation, abounding in muskegs and swamps with frequent rock outcrops. These rock outcrops form barriers across the river, and are the reason for the numerous falls and rapids. Some fifty-two falls and rapids occur between the first fall which is five miles from the mouth, and Family lake, and these vary in height between three and forty feet.

Family Lake also forms the source of the Pigeon river, which parallels the course of the Berens and empties into lake Winnipeg a few miles south of the mouth of the former river.

The Berens river was examined by a party sent out by the Manitoba Hydrometric Survey to determine its power possibilities. This survey revealed the fact that there are a number of feasible sites on the river.

The country is not heavily timbered but is covered with a growth of small spruce, poplar, birch and scrub oak. There is little merchantable timber to be found along the river.

Taken by D. B. Gow.

BERENS RIVER—PARTY METERING BERENS RIVER.

DISCHARGE MEASUREMENTS OF BERENS RIVER AT LITTLE GRAND RAPIDS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Feb. 27...	C. O. Allen........	1,912	194	3,285	0·48	93·50	1,570[1]

[1] Ice cover.

DISCHARGE MEASUREMENTS OF BERENS RIVER $8\frac{1}{2}$ MILES FROM MOUTH, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 2	C. O. Allen......	1,912	94	926	0·68	716·72	627·0[1]

[1] Ice cover.

NELSON RIVER.

GENERAL.

The Nelson river forms the outlet of lake Winnipeg, flowing through the central portion of northern Manitoba and emptying into Hudson's Bay at Port Nelson. The Nelson river discharges all the water collected by lake Winnipeg from an immense drainage area, and it forms one of the principal systems of the North American Continent, the basin comprising an area of 450,000 square miles.

The territory drained varies from the open prairie forming the great central plain to the rugged and magnificent country found in the Rockies, between these extremes of physical characteristics all gradations may be found in the basin. The vegetation to be found covers as wide a range.

The western part of the drainage area is practically devoid of lakes, but in the south and eastern portions are to be found some of the largest fresh water bodies on the continent. These lakes are so situated in relation to the Nelson river that the maximum natural storage effect is exerted upon the flow of that river; in consequence the maximum discharge may be expected to approximate closely to the mean discharge.

The river has a length of 430 miles, and in this distance the drop aggregates 712 feet. The potential power possibilities of the river are therefore apparent. In the upper reaches the river has the appearance of a chain of lakes connected by short stretches of river which are interrupted by falls and rapids. These characteristics which hold for the upper 250 miles of river gradually change as the mouth is approached, the drop in the river not being as distinct but more in the nature of swifts and flat rapids, though the banks become high as the Bay is approached.

The first expanse below the lake Winnipeg outlet is known as Playgreen lake, below which there are two channels known as East and West rivers. Sea falls is to be found on East river and the latter then expands into Pipestone lake. The junction of these two branches occurs in Cross lake. Below that point are Sepewesk, Split lake and Gull lake. The rapids and falls in order are Ebb and Flow rapids, Whitemud falls, Bladder rapids, Over the Hill, Red Rock and Chain of Rocks rapids; Manitou or Devil's rapids, Grand Rapids, Chain of Islands rapids, all being above Split lake. Below Split lake are Gull, Kettle, Long Spruce and Limestone rapids.

The country adjacent to the Nelson river is practically unsettled, though on account of the building of the Hudson's Bay railway there has been considerable activity along the river. The timber growth is scattered, including spruce, birch and poplar, and the clay soil to be found is very fertile.

A reconnaissance survey of the river was made by the late William Ogilvie in 1910 for the Dominion Water Power Branch, also discharge measurements were obtained. After gathering miscellaneous records in 1912-13, a metering station was established in 1914 by the Manitoba Hydrometric Survey above Manitou Rapids, and this has been operated since that date.

NELSON RIVER AT WARREN'S LANDING.

HISTORY.

A gauge was set at this point on September 28, 1913, by A. Pirie, and since that time records have been obtained at this station.

LOCATION OF GAUGE.

Warren's Landing is located at the head of the Nelson, where it flows from lake Winnipeg, and the gauge located here registers lake Winnipeg water level. The gauge is a six-foot vertical staff gauge and is secured to the side of dock of the Northern Fish Co.

RECORDS AVAILABLE.

Gauge records at this point are available from September 28 to December 31 of 1913; from January 1 to February 28, and from March 3 to December 31, of 1914, and from January 1 to October 13, 1915.

NELSON RIVER AT NORWAY HOUSE.

HISTORY.

A gauge was established on the Nelson river at Norway House on September 13, 1913, by A. Pirie, and gauge readings have been obtained at intervals since that time.

LOCATION OF GAUGE.

Norway House is located on the south channel of the Nelson river at the upper end of Little Playgreen lake and twenty miles below Warren's Landing. The gauge is a six-foot vertical staff gauge bolted to the rock in front of the Hudson's Bay Co. warehouse.

RECORDS AVAILABLE.

Since the installation of the gauge records have been obtained intermittently to the end of 1915.

NELSON RIVER ABOVE SHELL RAPIDS.

HISTORY.

This station was established by G. J. Lamb on July 18, 1914.

LOCATION OF SECTION.

The meter section is located at a point three and one-half miles upstream from Manitou landing and four miles above the Shell rapids. The I.P. is marked on a sloping face of rock northeast of the gauge and is a wooden plug driven in a 1½-inch hole drilled in the rock.

RECORDS AVAILABLE.

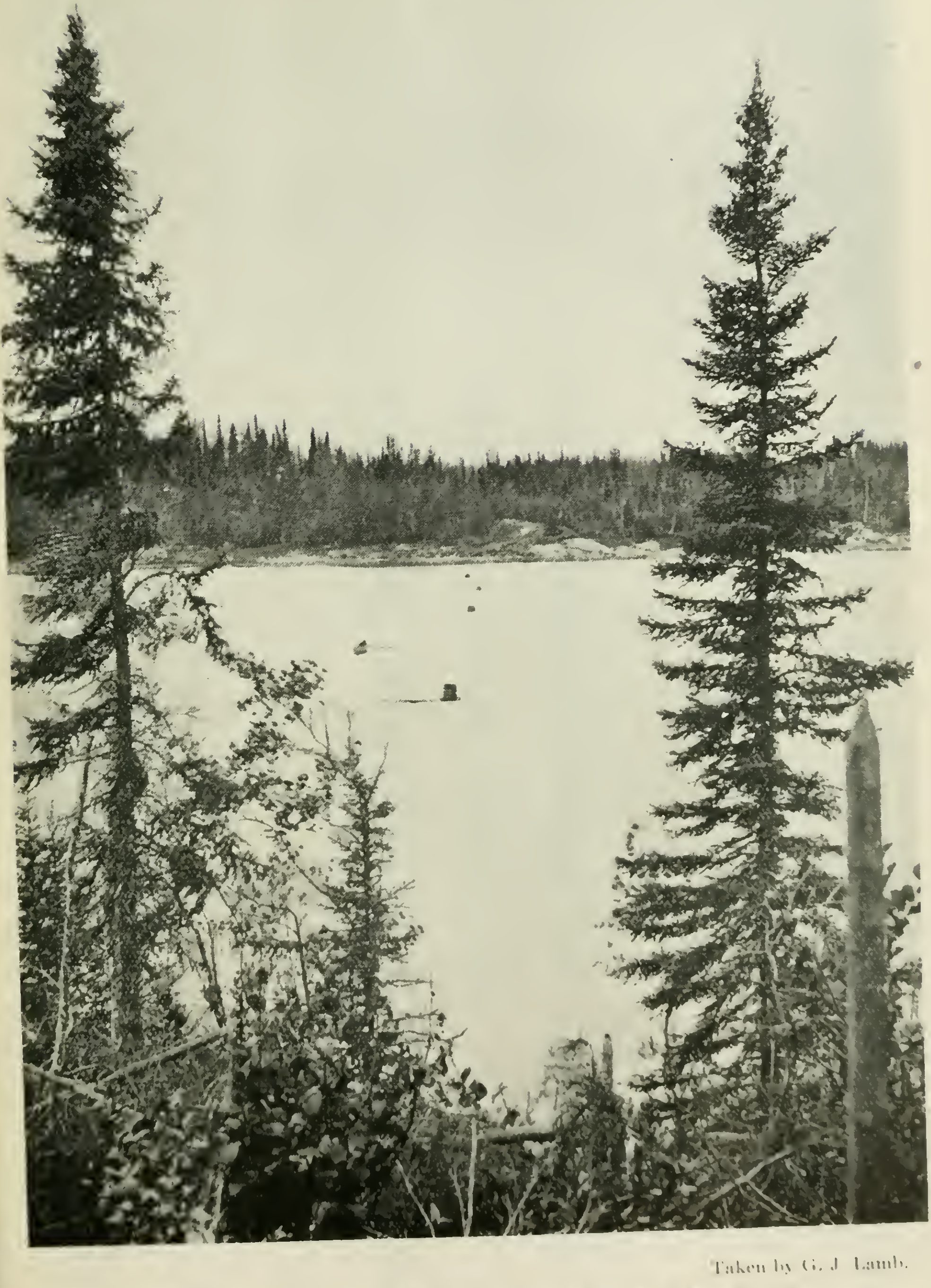
Records of daily gauge height were secured from July 2 to October 14, 1914, and from February 7 to April 10 and June 27 to October 9, 1915. A number of discharge measurements were taken over the same period.

DRAINAGE AREA.

The drainage area tributary to the Nelson river is 450,000 square miles, of which 24,000 square miles lies below Shell rapids. The river drains lake Winnipeg into Hudson's Bay. Practically all Canadian territory lying south of latitude 53 and between the summit of the Rockies and lake Superior is tributary to this river.

GAUGE.

The gauge is a vertical staff enamelled gauge fastened to a six-inch spruce post driven in the bed of the river and braced; it is further strengthened by being weighted with large boulders. The gauge is referred to a B.M. which is marked by a triangle painted in red on the face of the rock near the I.P. and marked "M.H.S. B.M." The datum of the B.M. is an assumed elevation.



Taken by G. J. Lamb.

NELSON RIVER—METER SECTION FOUR MILES ABOVE SHELL RAPIDS

CHANNEL.

For fifteen hundred feet above the section and eight thousand feet below, the channel is straight. The river is confined to the channel at all stages, and has a depth on the section varying between twenty and sixty-nine feet. The bed of the stream is of gravel and boulders and not liable to shift. The current is swift and the banks are high and wooded and not liable to overflow.

DISCHARGE MEASUREMENTS.

The meterings are made from a canoe held on the section by means of a stay line stretched across the river and supported on floats.

ACCURACY.

No daily discharge estimates have been arrived at from the gauge heights and discharge measurements, as it has been found impossible to define a regular rating curve on account of the varying slope in the river due to the prevalence of high winds.

Discharge Measurements of Nelson River at 4 Miles above Shell Rapids, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Feb. 11	A. Pirie	1,939	894	30,246	1·64	90·69	49,777
13	"	1,939	894	30,159	1·64	90·60	49,422
16	"	1,939	894	30,159	1·63	90·57	49,047
22	"	1,939	894	30,159	1·62	90·55	48,955
Mar. 3	"	1,939	894	29,840	1·49	90·31	44,418
6	"	1,939	890	29,743	1·52	90·13	45,322
8	"	1,939	890	29,570	1·59	89·99	46,977
9	"	1,939	890	29,395	1·53	89·77	45,017
12	"	1,939	890	29,132	1·60	89·50	46,600
15	"	1,939	890	28,957	1·62	89·30	47,014
16	"	1,939	890	28,870	1·63	89·22	47,187
22	"	1,939	890	28,432	1·64	88·65	46,546
26	"	1,939	890	27,923	1·61	88·35	44,888
29	"	1,939	890	27,923	1·60	88·31	44,566
30	"	1,939	890	27,835	1·62	88·21	45,245
31	"	1,939	890	27,835	1·52	88·14	42,284
April 7	"	1,939	890	27,111	1·66	87·36	45,064
July 14	M. S. Madden	1,469	899	31,917	2·13	89·88	68,084
15	"	1,469	899	32,005	2·16	90·00	69,485
16	"	1,469	899	31,917	2·16	89·86	69,034
19	"	1,469	899	32,181	2·17	90·13	69,977
20	"	1,469	899	32,193	2·08	90·14	67,428
23	"	1,469	899	32,193	2·19	90·15	70,469
26	"	1,469	899	32,093	2·26	90·04	72,501
27	"	1,469	899	32,181	2·20	90·11	70,773
28	"	1,469	899	32,181	2·22	90·09	71,752
29	"	1,469	899	32,092	2·21	90·08	70,954
30	"	1,469	899	32,092	2·24	90·07	71,879
Aug. 2	"	1,469	899	32,181	2·24	90·15	72,303
3	"	1,469	899	32,181	2·20	90·16	70,923
5	"	1,469	899	32,181	2·28	90·13	73,329
6	"	1,469	899	32,181	2·26	90·09	72,690
9	"	1,469	899	32,269	2·26	90·27	72,850
10	"	1,469	899	32,269	2·21	90·23	71,417
11	"	1,469	899	32,269	2·26	90.28	72,814
12	"	1,469	899	32,269	2·30	90·26	74,027
13	"	1,469	899	32,367	2·28	90·33	73,819
16	"	1,469	899	32,269	2·29	90·29	73,930
17	"	1,469	899	32,447	2·28	90·45	73,946
18	"	1,469	899	32,447	2·34	90·47	75,976
19	"	1,469	900	32,438	2·28	90·48	73,819
25	"	1,469	900	32,447	2·30	90·48	74,647
30	"	1,469	900	32,535	2·30	90·53	74,463
31	"	1,469	900	32,447	2·29	90·46	74,294
Sept. 2	"	1,469	900	32,535	2·36	90·48	76,823
3	"	1,469	900	32,535	2·27	90·52	73,850
6	"	1,469	900	32,447	2·29	90·45	74,247
7	"	1,469	900	32,447	2·31	90·44	75,019
13	"	1,469	900	32,447	2·33	90·38	75,720
14	"	1,469	900	32,369	2·33	90·36	75,499
16	"	1,469	900	32,369	2·31	90·38	74,820
17	"	1,469	900	32,369	2·31	90·34	74,700
20	"	1,469	900	32,369	2·26	90·38	73,206
24	"	1,469	900	32,369	2·32	90·39	75,047
27	"	1,469	900	32,535	2·32	90·50	75,427
30	"	1,469	900	32,535	2·29	90·50	74,432

Note:—Ice cover conditions.

MISCELLANEOUS RECORDS.

In a number of cases where stations have been established after one or several meterings have been taken, it has been found that the location was not a desirable one, either on account of the difficulty in obtaining an observer for the daily gauge heights or on account of the physical features obtaining at the station preventing accurate records being obtained.

In other cases sufficient information has not been obtained to properly define a discharge curve, though the records obtained would indicate that a curve may be defined by fuller information. In this case the gauge heights are on file, and when the necessary additional data is secured estimates of daily discharge will be made.

Where the above conditions have been encountered, and as the discharges obtained may be of some immediate value, the records are published under the headings, "Miscellaneous Records."

Discharge Measurements of Cypress River at Cypress River, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 19 . .	M. S. Madden	1,462	2·8	0·6	0·33	92·57	0·2

Discharge Measurements of Clear Creek at Outlet of Clear Lake, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Jan. 28 . .	W. J. Ireland	1,939	12·0	13·8	1·25	95·35	17·3

Discharge Measurements of Grass River at Standing Rock Falls, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Aug. 5. .	H. O. Leach	1,186	92	538	2·07	564·20	1,112
Sept. 15. . .	"	1,186	115	707	1·22	563·86	861

Discharge Measurements of Grass River at Paint Lake, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec	Feet.	Sec. ft
July 31	D. B. Gow.	1,186	121	1,053	0·78		818
Sept. 13	"	1,186	115	989	0·81	580·7	806

Taken by D. B. Gow.

GRASS RIVER—LYNX FALLS—FROM RIGHT BANK.

Taken by D. B. Gow.

GRASS RIVER—HEAD OF STANDING ROCK FALLS SHOWING STANDING ROCK.

DISCHARGE MEASUREMENTS OF GRASS RIVER, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
June 23.	D. B. Gow......	1,186	121	279	1·04	785·88	292	Above Sixth Rapids.
June 29.	H. O. Leach....	1,186	43	74	2·05	857·76	151	Above Ninth Rapids.
July 1.	"	1,186	38	81	1·05	......	85	First Rapids above Reed Lake.
July 21	D. B. Gow....	1,186	72	632	0·98	655·80	618	Below Lynk Falls.
July 24.	" .	1,186	71	381	1·70	603·20	648	Above Second Rapids.

DISCHARGE MEASUREMENTS OF HERON CREEK AT JUNCTION WITH LITTLE SASKATCHEWAN RIVER, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
May 8.	E. B. Patterson..	1,920	15·0	6·3	0·63	......	3·9	At mouth.
May 17.	" ...	1,920	18·5	7·9	0·86	......	6·7	"
May 28.	" ...	1,920	17·0	5·7	0·63	......	3·6	"
June 3.	" ...	1,920	14·5	5·1	0·37	......	1·9	150 yards from mouth.
June 16.	" ...	1,920	10·8	5·2	0·99	......	5·1	" "
July 24.	G. K. Gainsford..	1,435	23·0	31·3	0·04		0·9	400 yards from mouth.

DISCHARGE MEASUREMENTS OF LA SALLE RIVER AT SANFORD, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec. ft.
May 3...	A. Pirie......	1,939	16	8·2	0·33	89·21	2·7

DISCHARGE MEASUREMENTS OF MORRIS RIVER AT ROSENORT BRIDGE, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height	Discharge.
			Feet	Sq. ft.	Ft. per sec	Feet.	Sec.-ft.
May 13	A. Pirie..	1,939	34	50·1	0·18	85·39	8·9
May 27	T. J. Moore.	1,196	29	37·8	0·03	84·85	1·2
June 30	E. B. Patterson	1,920	51	196·9	0·00	88·67	0·0

DISCHARGE MEASUREMENTS OF McDONALD CREEK AT JUNCTION WITH LITTLE SASKATCHEWAN, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
May 18.	E. B. Patterson.					96·87	0·33[1]
May 19	"					96·87	0·33[1]
July 24	G. K. Gainsford					96·90	0·27[1]
Aug. 24	H. H. Pratt...					96·91	0·29[1]
Sept. 25.	G. K. Gainsford					96·91	0·29[1]

[1] Weir measurements.

DISCHARGE MEASUREMENTS OF MANAZO RIVER AT FIRST RAPIDS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Aug. 26.	H. O. Leach.	1,186	31	173·5	0·45		78·6

DISCHARGE MEASUREMENTS OF OAK CREEK AT TREESBANK, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 20.	M. S. Madden....	1,462	4	1·2	0·36	[1]...	0·4

[1] No gauge.

DISCHARGE MEASUREMENTS OF OTTER CREEK NEAR SCANDINAVIA, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 22	E. B. Patterson.	1,920	4	0·93	0·44	87·91	0·41
June 10.	"	1,920	16	18·40	0·36	88·85	6·6
21.	"	1,920	16	17·7	0·19	88·75	3·38
July 21	G. K. Gainsford	1,435	14	10·5	..	88·41	No flow.[1]
Aug. 20.	H. H. Pratt...					88·21	No flow.[1]

[1] Beaver dams blocking flow.

DISCHARGE MEASUREMENTS OF ODEI RIVER ABOVE FIRST FALLS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Aug. 21..	D. B. Gow. . . .	1,186	64	264	2·25	....	596

DISCHARGE MEASUREMENTS OF PEMBINA RIVER AT LA RIVIERE, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
April 28 . .	M. S. Madden.	1,462	14	17·6	0·73	91·71	12·8
May 26. . .	T. J. Moore.	1,196	14	9·4	0·41	91·42	3·8
June 29. . .	T. H. Boyd.	1,196	12	7·5	0·63	91·42	4·7
June 29	"	1,196	12	5·5	0·66	91·40	3·7
June 30	"	1,196	12	5·7	0·57	91·39	3·2

DISCHARGE MEASUREMENTS OF PEMBINA RIVER 3 MILES NORTH OF KILLARNEY, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
April 26. . .	M. S. Madden.	1,462	5	1·2	1·3	89·83	1·6

DISCHARGE MEASUREMENTS OF PIGEON RIVER BELOW STURGEON FALLS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft
Mar. 5 . .	C. O. Allen.	1,912	210	3,139	0·34	726·99	1,163[1]

[1] Ice measurement.

DISCHARGE MEASUREMENTS OF PIGEON RIVER ABOVE FIRST FALLS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge
			Feet	Sq. ft.	Ft. per sec	Feet	Sec. ft
Mar. 4	C. O. Allen .	1,912	93	805	1·81	89·33	1,458[1]

[1] Ice measurement.

Discharge Measurements of Qu'Appelle River near Welby (Sask.), 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
June 1	C. O. Allen	2,018	41	73·4	1·07	1·15	79·1

Discharge Measurements of Qu'Appelle River at DeCorby's Farm, St. Lazare, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
July 30.	T. H. Boyd	1,197	45	55·8	1·13	....	63·1
Sept. 6.	"	1,197	39	21·5	0·87	91·65	18·7
Oct. 27	C. O. Allen	1,374	44	38·5	0·89	92·05	34·4

Discharge Measurements of Whitemud River at Holmfield, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
April 26.	M. S. Madden	1,462	25·0	38·6	0·05	86·17	2·0

Discharge Measurements of Winnipeg River at Dalles, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge. Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet	Sec. ft.
May 22	S. C. O'Grady.	1,469	252	7,246	2·65	1,035·60	19,201

Discharge Measurements of Winnipeg River at Throat Rapids, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec	Feet	Sec.-ft.
May 23	S. C. O'Grady.	1,469	111	628	3·74	1,037·77	2,350

DISCHARGE MEASUREMENTS OF WINNIPEG RIVER BELOW LAKE OF THE WOODS OUTLETS, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 22	S. C. O'Grady	1,718	179·8	2,184	2·28	34·62	4,983

DISCHARGE MEASUREMENTS OF BLOODVEIN RIVER 8 MILES FROM MOUTH, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
Mar. 7	C. O. Allen	1,912	51	237	1·63	715·57	386[1]

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[1] Ice cover.

DISCHARGE MEASUREMENTS OF BOYNE RIVER AT CARMAN, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.
April 30	M. S. Madden	1,462	27·0	43·5	0·44	84·04	19·3
May 28	T. J. Moore	1,196	22·8	12·5	0·37	83·28	4·6
June 28	T. H. Boyd	1,197	10·1	8·6	0·27	83·17	2·3
Aug. 6	"	1,197	15·3	9·6		82·56	0·0[1]

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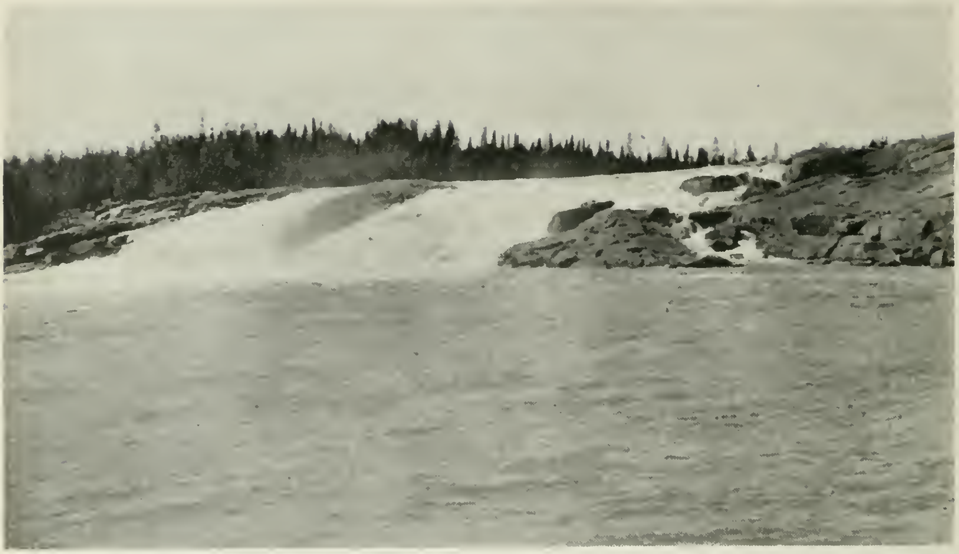
[1] No discharge.

DISCHARGE MEASUREMENTS OF BURNTWOOD RIVER AT MANAZO FALLS, 1915.

Date.	Engineer.	Meter No.	Width.	Area of Section	Mean Velocity	Gauge Height.	Discharge
			Feet	Sq. ft.	Ft. per sec	Feet	Sec. ft
Aug. 26	D. B. Gow.	1,186	183	2,530	0·78	55·70	1,985
Sept. 11	H. O. Leach	1,186	179	2,139	0·67		1,633



Taken by D. B. Gow.

BURNTWOOD RIVER—MANAZO FALLS—FROM LEFT BANK NEAR FOOT.

Taken by D. B. Gow.

BURNTWOOD RIVER—ROCK BANK

Taken by D. B. Gow.

BURNTWOOD RIVER—TASKINIGAP FALLS—PARTIAL VIEW FROM HIGH RIDGE BELOW.

DISCHARGE MEASUREMENTS OF BURNTWOOD RIVER, 1915.

Date.	Engineer.	Meter. No.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.	Remarks.
			Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec. ft.	
Aug. 19.	D. B. Gow......	1,186	261	1,636	1·51	517·30	2,473	Above First Rapids.
Sept. 3.	H. O. Leach.....	1,186	90	337	1·14	739·80	386	One mile below Gate Rapids.
Sept. 6.	D. B. Gow.......	1,186	132	865	1·67	......	1,448	Three miles below Three Point Lake.

PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC SURVEY
FOR
THE CALENDAR YEAR, 1915

PART III
LAKE OF THE WOODS DATA

PART III.

LAKE OF THE WOODS DATA

LAKE OF THE WOODS MILLING CO. MILL "A" HEADRACE AND TAILRACE GAUGES.

HISTORY.

The recording of the water levels in the forebay and tailrace of Mill "A" was commenced by the Lake of the Woods Milling Company in May of 1896 and was discontinued in January of 1912.

LOCATION.

There were no gauges set at these locations, the readings were taken by measuring down from the floor of the power house, the elevation of which was 1063.00 W.P.S. Datum. The readings were recorded in feet and inches below this elevation.

RECORDS AVAILABLE.

From the time of the commencement of the record on May 3, 1896, readings were taken at irregular intervals each year until January 12, 1912, at which time the reading of these water levels was discontinued.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A," KEEWATIN, FOR 1896 AND 1897.

1896

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						3' 6"						
2							2' 8"		3' 7½"			
3												
4					6' 0"			2'11"				
5												
6						3' 4"	2' 9½"					
7										4' 4"		
8									3' 8"			
9							2' 5½"					
10												
11						3' 0"	2' 4"					5' 4"
12												
13					5' 6"							
14										4' 6"		
15									3'10"			
16						2'11"	2' 7½"					
17							2' 3½"					
18						2'11"		2'11"				
19					4'10"							
20							2'11"					
21											5' 1½"	
22						2'11"				4' 9"		
23					4' 4"				3' 8"			
24							2' 8½"	3' 0"				
25						2'11"						
26					4' 2"							
27						2'10½"						
28												
29					3'11"	2' 8"						
30									4' 2"	5' 4½"		
31							2' 9½"					

1897.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						3'11"						
2												
3							3' 4"					
4					4' 6"							
5										4' 8½"	4' 8½"	
6								2' 8"				
7					4' 4½"							
8							3' 3"					
9						3' 7"						
10				6' 6"								
11												
12				6' 3"								
13			6' 7½"				2' 9½"					
14												
15												
16				5'10½"								
17						3' 7"						
18					4' 4"					5' 1"		
19												
20				5' 6"								
21							2' 8"					
22												
23				5' 2"			2' 7"		3'10"			
24												
25					4' 0"			3' 0"				
26				5' 0"								
27												
28						3' 4"	2' 6"			5'10½"		
29							2' 5"			4' 6½"		
30				4' 8½"								
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063 0 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A", KEEWATIN, FOR 1898 AND 1899.

1898.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1										4' 11"		
2												
3					7' 7½"	7' 7"		5' 9"				
4							6' 3½"					
5												
6												
7												
8				7' 7"								
9							6' 2"					
10						7' 2½"						
11				7' 7"								
12										5' 1"		
13								5' 6"				
14							5' 11"					
15			7' 3"			7' 2½"				4' 9"		
16					7' 8"							
17												
18										5' 3"		
19				7' 3"								
20							6' 0"			5' 0"		
21												
22		6'11"				7' 2"						
23									5' 0½"			
24												
25					7' 7"						4' 7"	
26							5' 8½"					
27												
28						6' 7"				4' 8½"		
29												
30								5' 5"				
31										4' 4"		

1899.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2					4' 9"					4' 2"		3' 8"
3												
4										4' 3"		
5						3' 9"		2'10"	3' 5"	4' 4"		
6										4' 1½"	3' 9"	
7										4' 3½"		
8												
9						3' 7"						
10												
11												
12												3' 10"
13				5' 0"								
14							2' 8"			4' 2"		
15												
16		1' 6"										3'10"
17												
18							2' 7"		3'11"			
19												
20					4' 1"							
21				5' 0½"				3' 0"				3'10"
22												
23										3'10"		
24												
25												
26					4' 1"						3' 4"	
27							2' 7"		3'11"			3'11"
28									5' 3½"			
29						2'11"						
30												
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A", KEEWATIN, FOR 1900 AND 1901.

1900.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug	Sept.	Oct	Nov.	Dec
1												
2								6′ 5″		4′ 4″		
3											2′ 8″	
4											2′ 2″	
5						5′ 8″						
6							6′ 0″				2′11″	
7				5′ 6″	5′ 5″							
8	4′ 3″		5′0½″							3′ 8½″	2′ 9″	
9						5′ 8″	6′ 1½″				2′ 4″	
10											2′11″	
11										3′ 6″		
12					5′ 7″				5′ 2″		2′11″	
13										3′ 4″		2′10″
14				5′5½″							2′ 9″	
15												
16						6′ 0″		6′ 2½″		3′ 4″	2′ 8″	
17									5 ′0″	3′ 2″	2′ 8″	
18	4′ 2″											
19			5′ 3″		5′ 8″					3′ 2″		
20										3′ 2″	2′ 8″	
21				5′5½″			6′ 1″					
22									4′ 5″		2′ 7″	
23										3′ 1″		
24										3′ 2″	2′ 7″	
25								6′ 2″	4′ 0″	3′ 2″		
26												
27										3′ 0″		
28						6′ 3″			4′ 0″			
29											2 7″	
30					5′ 9″					2′10½″		
31			5′5½″							2′11″		

1901.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug	Sept.	Oct	Nov.	Dec
1				5′ 2″		3′9½″		3′10″				
2							3′ 9″				4′ 7″	
3									4′ 1½″			
4						3′ 8″	3′ 9″					
5							3′ 8½″		4′ 1″			5′ 1″
6						4′ 2″	3′ 9″	4′ 2½″				
7										4′ 8″		
8				5′ 0″	3′10½″	3′10½″	3′ 6″					
9					3′ 9″		3′ 9″					
10					3′ 6″		3′ 7¾″					
11						4′ 0″			4′ 4½″			5′ 1½″
12				4′ 7″								
13						3′10″	3′ 6¾″					
14					3′ 6″							
15					3′ 6½″							
16					3′ 7″					4′10″		
17					3′ 6″		3′ 9″		4′ 7″			5′ 3″
18						3′ 9″			4′ 5″		4′11″	
19								4′ 4½″				
20					3′ 8″	3′11″						
21					3′ 8″				4′ 7″			
22					3′11″	3′11″	3′ 9″	4′ 3″				
23		4′ 2″			4′ 0″					4′ 7½″		
24					3′10	3′10½″	3′11″	4′ 3″				
25					3′8½″				4′ 8″			
26						3′ 9″		4′ 2″			5′ 1″	
27					3′ 8½″							
28					3′ 9″	3′ 9″		4′ 1″		4′ 8″		5′ 3″
29					3′ 9½″		3′10″					
30					3′10″							
31					3′11″			4′ 1″				

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A", KEEWATIN, FOR 1902 AND 1903.

1902.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1									4' 6½"			
2						4' 2"	4' 1"		4' 4½"			
3									4' 9"			
4				6' 2"				4' 3"	4' 4½"		5' 6"	
5							3'10"		4' 1"			
6						3'11"					5' 4"	
7						4' 1"		4' 1"			5' 0"	
8					5' 8"		3' 9¾"		4'10"			
9						4' 0"		3' 9"				
10			6' 1"				3'11"					
11						4' 1"		4' 1½"				
12												
13		5'10"			5' 0"							
14						4' 0"	4' 1½"					
15												
16						3'11"	3'11½"	4' 0½"				
17						3'10½"				5' 2½"		
18						3' 9"	4' 0½"					
19						4' 2"						
20	5'8"				4' 8"							
21						4' 1½"	4' 0¾"					
22								4' 2½"				
23						4' 1"	4' 0"					
24				6' 0"			4' 0"					
25						4' 4"						
26						4' 1½"	3'10½"					
27												
28							3'11"					
29												
30				5' 9"								
31										5' 1½"		

1903.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						3' 3½"						
2												
3												
4					3' 8"							
5					3' 7"							
6					3' 9"							
7					3' 7"							
8					3' 6½"	3' 5"	3' 5½"	4' 6½"				
9						3' 7"						
10								4' 8½"				
11				4' 6"	3' 7½"							
12	5' 1"				3' 7"	3' 2"	3'10"					
13												
14								4' 4"	4' 9"			
15												
16						3' 6"						
17												
18				4' 3"	3' 5½"			4' 6"				
19												
20						3' 7½"	3'11"	4' 3"				
21				4' 1"								
22					3' 5"							
23					3' 4"	3' 7"						
24												
25					3' 3½"							
26		5' 3"						4' 7"				
27							4' 0"					
28					3' 4"							
29												
30				3' 8"	3' 2½"		4' 5"					
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A", KEEWATIN, FOR 1904 AND 1905.

1904.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1						5 0″						6′ 10″
2												
3					5′10″							
4												
5												
6												
7											6′ 2″	
8				6′ 8″						5′ 8″		
9												
10												6′10″
11					5′ 5″	4′ 6″						
12				6′ 8″								
13												
14											6′ 0″	
15											6′ 5″	
16				6′ 8″			4′ 0″				6′ 2″	
17												
18			6′ 7½″		5′ 1″							
19											6′ 7″	
20												
21											6′ 4″	
22										6′ 1″		
23								4′ 7″				
24												
25												
26												
27												
28												
29												
30												
31												

1905.

1								3′ 1″	3′ 1½″	1′11″		
2												
3	6′ 6″				7′ 5″		3′11½″				3′ 6″	
4						5′1½″				3′ 3½″		
5								3′ 0½″		3′ 2½″		
6									3′ 3″			
7										3′ 3″		
8												
9					7′ 2″				3′ 5″	3′ 3″		
10				7′2½″			3′ 5″	2′11″				
11			6′11½″						3′ 5″	3′ 7″		
12								3′ 0½″	3′ 7½″			3′ 4″
13					6′ 9″		3′ 6″					
14									3′ 5″	3′ 5½″		
15							3′ 3″	2′11½″	3′ 4½″			
16									3′ 5″	3′ 6″		
17								2′ 8½″				
18									3′ 5″			
19									3′ 1½″			
20						4′ 8″	3′ 2½″	2′ 2½″	2′11″			
21		6′11″					3′ 0½″					
22							3′ 2″		3′ 3″			
23									3′ 1″	3′ 9″		
24							3′ 0″			3′ 7″		
25									3′ 1″	3′ 1½″		
26	6′ 7″											
27							3′ 1″			3′ 7″		3′ 3½″
28		7′ 1″							3′ 1″			
29							3′ 1″	3′ 0½″				
30								3′ 3″		3′ 4″		
31												

Relation between gauge reading and datum:
Zero of gauge = 1,063·0 W.P.S. datum

Mean Daily Gauge Height, in Feet, of Forebay Mill "A", Keewatin, for 1906 and 1907.

1906.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3' 4"				3' 7½"	3' 8½"					5' 3"	
2				4' 1"	3' 7"	3' 8"				4'11"	5' 4"	
3			3'9½"		3'6½"	3' 3½"	3'7½"				5' 5"	
4					3' 9"	3' 8"				5' 4"		
5					3' 9"						5' 6"	
6	3' 4½"					3' 8"						
7				4' 2"		3' 6"					5'5½"	
8											5'2½"	
9							3' 8"			5'10"	5'4½"	
10					3' 6"				4' 7"		5'6½"	
11					3' 6"	3' 8"		4' 1"		5' 0"		
12									4' 8½"	5' 1"	5' 5"	
13						3' 6"	3' 9"			5' 4"		
14												
15					3' 6"	3' 9"				5' 0"	5' 6"	
16					3' 6"	3' 8"	3'11"			4'11"		
17			3' 10"						4' 9"	4'11"	5' 8½"	
18				3'10"	3' 3½"				4' 9"	5' 1½"		
19									4' 9½"	5' 3½"		
20						3'11"			4' 9"	5' 4½"		
21					3' 7½"							
22					3'10"					5' 4"		
23					3' 9"					5' 4"		
24				3' 7"	3'10"					5' 2½"		
25				3' 7"	3'11"	3' 9"	4' 0"			5' 1½"		
26				3' 7"	4' 2"	3' 8"			4'11"	5' 3½"		
27	3' 3"			3'7½"	3' 5"			4' 3"		5' 8"		
28				3' 7"	3'10"						5' 6"	
29										5' 6½"		
30				3' 8"						5' 5"		
31										5' 2"		

1907.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1								5' 0"				
2							4'10"		4' 1"			
3												
4										3' 2"		
5												
6												
7						5' 3"	4'11"				3' 3"	
8												
9									4' 0"			3' 6"
10						5' 2"						
11										3' 8"		
12						5' 2"		4' 6"				
13												
14					6' 1"					3' 5"		
15								4' 0"				
16										3' 8"		
17												
18				6' 4"								
19								4' 1"				
20							4' 9"					
21												
22					5' 7"		5' 0"					
23			6' 4"									
24						4'11"						
25											3' 6"	
26								4' 2"				
27									3' 4"			
28										3' 5"		
29					5' 5"			4' 1"				
30				6' 4"								
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W P.S datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A", KEEWATIN, FOR 1908 AND 1909.

1908.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2							3′ 0″		4′ 2″			
3												
4												
5												
6								3′ 8″				
7									4′ 4″			4′11″
8												
9									4′ 6″			
10				3′ 2″						5′ 4″		
11												
12			3′ 5″							4′ 4″		
13												
14					3′ 1″					4′ 7″		
15												
16						3′ 0″						
17												
18									4′10″			
19												
20							3′ 2″					
21												
22												
23											5′ 1″	
24												
25	3′ 7″											
26												
27												
28									4′ 8″		4′11″	
29												
30												
31												

1909.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						5′ 5″						
2											4′ 7″	
3		5′ 4″										4′ 6″
4												
5										4′10″		
6							5′ 0″					
7												
8									5′ 1″			
9											4′ 2″	
10												
11						5′ 3″						
12												
13										5′ 1″		
14												
15												
16									5′ 0″			
17					5′ 8″							
18											4′ 5″	
19												
20					5′ 7″							
21						5′ 0″						
22			5′10″									
23				6′ 2″								
24												
25												
26								4′ 8″				
27												
28									4′11″			
29	5′ 2″											
30												
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W.P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF FOREBAY MILL "A", KEEWATIN, FOR 1910 AND 1911.

1910.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				3′ 5″							6′ 7″	
2				3′ 5″								
3					2′10″							
4											6′ 5″	
5			3′ 9″									
6										6′ 3″		
7				3′ 1″								
8												
9											6′11″	
10							4′ 6″					
11								5′ 1″				7′ 0″
12			3′ 9″									
13					3′ 0″		4′ 5″					
14						3′ 7″						
15									5′ 9″		6′ 9″	
16												
17												
18		4′ 3″										
19										7′ 3″		
20												
21					3′ 2″							
22							4′10″					
23			3′ 9″									
24								5′ 6″				
25				2′ 9″	3′ 3″							
26												
27							4′11″					
28												
29				2′11″								
30			3′ 6″									
31												

1911.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												8′ 4″
3												
4							7′ 6″					
5							7′ 9″					
6												
7												
8												
9												
10							7′ 4″					
11												
12												
13							8′ 0″					8′ 3″
14											8′ 8″	
15		7′ 7″				7′ 9″						
16												
17												
18							8′ 4″					
19												
20												
21			8′ 1″									
22											8′ 6″	
23	7′ 6″											
24												
25							9′ 0″	8′ 6″				
26					8′ 4″							
27												
28												
29						7′ 4″						
30												
31	7′ 9″											

Relation between gauge reading and datum:—
Zero of gauge = 1,063.0 W.P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A", KEEWATIN, FOR 1896 AND 1897.

1896.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						20' 6"						
2							18' 1½"		19' 7½"			
3												
4					24' 2"			18'10"				
5												
6						20' 0"	18' 7"					
7										20' 9		
8									19' 9"			
9							18' 5½"					
10												
11						19' 8"	18' 5"					22' 5½"
12												
13					23' 4"							
14										20'11"		
15									20' 0"			
16						19' 6"	18' 6½"					
17							18' 5"					
18						19' 0"		19' 0"				
19					22' 5"							
20							18' 8"					
21											22' 1"	
22						18'11"				21' 5½"		
23					21' 9"				20' 2"			
24							18' 8½"	19' 2½"				
25						18' 9"						
26					21' 4"							
27						18'7½"						
28												
29					21' 0"	18'7½"						
30									20' 6"	22' 1"		
31							18'9½"					

1897.

1						20' 4"						
2												
3							19'4½"					
4					21' 4"							
5										19' 11½"	21' 4½"	
6								18' 3"				
7					21'2½"							
8							19' 2"					
9						20' 1½"						
10				24' 6"								
11												
12				24' 4"								
13			24' 9½"				18'11½"					
14												
15												
16				23' 8"								
17						19'8½"						
18					20'10"					20' 6½"		
19												
20				23' 0"								
21							18' 4½"					
22												
23				22' 6"			15' 4"		19' 5"			
24												
25					20' 7"			18' 6"				
26				22'1½"								
27												
28						19'5½"	18' 3"			21' 0"		
29							18'2½"			21' 1"		
30				21'8½"								
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W.P.S. datum.

Mean Daily Gauge Height, in Feet, of Tailrace Mill "A", Keewatin, for 1898 and 1899.

1898.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept	Oct.	Nov.	Dec
1										21'10"		
2												
3					26' 5"	26'4½"		23' 0"				
4							21' 5"					
5												
6												
7												
8				26' 8"								
9							21' 0"					
10						26' 1"						
11				26' 8"								
12										21'11"		
13								22' 8"				
14							23' 6"					
15			26' 0"			26' 0"				22' 4"		
16					26' 6"							
17												
18										23' 6"		
19				26' 8"								
20							23' 5½"			23'10"		
21												
22		25' 5"				25' 9"						
23									22' 1½"			
24												
25					26'5½"						26' 3"	
26							23' 2"					
27												
28						25' 1"				23'10½"		
29												
30								22' 5"				
31										23'11"		

1899.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept	Oct.	Nov.	Dec
1												
2					21' 3"					20' 2"		25'10"
3												
4										21' 6"		
5						19'6"		18' 0"	18'7½"	22' 1"		
6										22' 6"	25'10"	
7										22' 9"		
8												
9						19' 3"						
10												
11												
12												26' 0"
13				25' 9"								
14							18' 1"			25' 3"		
15												
16		25' 0"										23' 9"
17												
18							18' 0"		19' 2"			
19												
20					20' 3"							
21				23'3½"				18' 5"				23' 4"
22												
23										25'10"		
24												
25												
26					20' 1"						25'10"	
27							17'11"		19' 5"			23' 4"
28									19' 8½"			
29						18' 8"						
30												
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W P S datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A", KEEWATIN, FOR 1900 AND 1901.

1900.

Day	Jan.	Feb.	Mar.	April	May	June	July.	Aug	Sept.	Oct	Nov.	Dec
1												
2								27′ 4″		25′ 0″		
3											18′ 0″	
4						27′ 5″					18′ 2″	
5												
6							27′ 5″				18′ 1″	
7				26′ 6″	27′ 3″							
8	23′ 8″		24′ 9″							23′11½″	18′ 1″	
9						27′ 5″	27′ 5″				17′11″	
10											18′ 0″	
11										22′ 6″		
12					27′ 2″				26′ 10″		18′ 0″	
13										20′ 7″		17′10″
14				26′11½″							18′ 0″	
15												
16						27′ 5″		27′ 1″		19′ 9″	17′11″	
17									26′ 7″	19′ 5″	17′10″	
18	23′ 8″											
19			24′11½″		27′ 3″					19′ 0″		
20										19′ 0″	17′11″	
21				27′ 2½″			27′ 3″					
22									26′ 4″		17′10″	
23										18′ 8″		
24										18′ 8″	17′10″	
25								27′ 1″	26′ 1″	18′ 6½″		
26												
27										18′ 5″		
28						27′4½″			25′ 0″			
29											17′9½″	
30					27′ 5″					18′ 5″		
31			25′ 3″							18′ 3″		

1901.

Day	Jan.	Feb.	Mar.	April	May	June	July.	Aug	Sept.	Oct	Nov.	Dec
1				21′ 1″		20′10″		20′ 8″				
2							20′ 9″				26′ 1″	
3									24′ 8″			
4						20′ 9″	20′ 9″					
5							20′7½″		24′ 8″			26′ 6″
6						20′11″	20′ 7″	20′10″				
7										25′ 6″		
8				25′ 0″	23′10″	20′11″	20′ 6″					
9					23′ 5″		20′ 6″					
10					23′ 2″		20′5½″					
11						20′10″			25′ 0″			26′ 6″
12				26′ 6″								
13						20′10″	20′ 4¼″					
14					23′ 0″							
15					22′11″							
16					22′10″					25′10″		
17					22′8½″		20′ 5″		25′ 2″			26′ 6″
18						20′ 9″			25′ 3″		26′ 5″	
19								21′ 1″				
20					21′ 3″	20′ 9″						
21					21′ 1″				25′ 3″			
22					21′ 0″	20′9½″	20′ 5″	21′ 7″				
23		20′ 0″			21′ 0″					25′11″		
24					20′11″	20′9½″	20′ 7″	23′ 1″				
25					20′10″				25′ 4″			
26						20′ 9″		23′11″			26′ 6″	
27					20′11″							
28					20′10″	20′8½″		21′ 2″		26′ 1″		26′ 6″
29					20′10″		20′ 8″					
30					20′10″							
31					20′10″			21′ 6″				

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A", KEEWATIN, FOR 1902 AND 1903.

1902.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1									23′ 2″			
2						26′ 1″	19′ 7″		23′ 1½″			
3									23′ 1″			
4				27′ 0″				23′ 0″	23′ 9″		25′ 0″	
5							19′ 5″		24′ 0″			
6						25′ 2″					25′ 0″	
7						23′11″		23′ 0″			25′ 0″	
8					26′ 4″		19′4½″		25′ 0″			
9						22′ 7″		22′11″				
10			27′1″				19′4½″					
11						21′11″		23′0½″				
12												
13		26′10″			26′ 4″							
14						21′ 0″	19′5½″					
15												
16						20′ 7″	19′5½″	23′ 0″				
17						20′ 3½″				25′1½″		
18						19′ 9″	19′5½″					
19						19′ 9″						
20	26′ 8″				26′ 2″							
21						19′7½″	19′7¾″					
22								23′ 1″				
23						19′ 7″	19′11½″					
24				26′10″			20′ 7″					
25						19′ 6½″						
26						19′ 6½″	21′10½″					
27												
28							22′ 5″					
29												
30				26′10″								
31										25′ 0″		

1903.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						19′ 5½″						
2												
3												
4					24′10″							
5					23′10″							
6					22′11″							
7					21′10½″							
8					21′ 3½″	19′ 8″	20′ 0″	20′ 11″				
9						19′ 8″						
10								21′ 3½″				
11				25′ 8″	20′ 7½″							
12	25′ 2″				20′ 5″	19′ 7″	20′ 1½″					
13												
14								23′ 5″	24′ 7″			
15												
16						19′10″						
17												
18				25′ 4″	19′10″			23′10″				
19												
20						19′10½″	20′ 6½″	24′ 1″				
21				25′ 1″								
22					19′ 6″							
23					19′ 5″	20′00″						
24												
25					19′ 5″							
26		25′ 3″						24′ 5″				
27							20′ 7″					
28					19′ 5″							
29												
30				24′ 10″	19′ 5″		20′ 8″					
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A," KEEWATIN, FOR 1904 AND 1905.

1904.

Day.	Jan	Feb.	Mar	April	May	June	July	Aug	Sept.	Oct	Nov.	Dec.
1						24' 8"						26' 0"
2												
3					25' 2"							
4												
5												
6												
7											22' 2"	
8				25' 8"						24' 8"		
9												
10												26' 2"
11					24'11"	21' 4"						
12				25' 8"								
13												
14											25' 4"	
15											25' 5"	
16				25' 8"			21' 0"				25' 5"	
17												
18			25' 8"		24' 9"							
19											25' 8"	
20												
21											25'10"	
22										21' 9½"		
23								21' 1"				
24												
25												
26												
27												
28												
29												
30												
31												

1905.

1								19' 5"	18' 8½"	20' 2"		
2												
3	26' 2"				26' 2"		21'10"				24' 6"	
4						25' 7½"				20' 4½"		
5								19' 1"		20' 5½"		
6									18' 11"			
7										20' 5½"		
8												
9					26' 2"				18'10"	20' 8"		
10				26' 1"			23' 11"	18' 8"				
11			26'6½"						19' 0"	20'10"		
12								18' 8"	19' 0½"			21'10"
13					25'11"		23' 0"					
14									19' 1"	20'11"		
15							22' 2"	18' 4½"	19' 1½"			
16									19' 6"	21' 2"		
17								18' 1½"				
18									19'11"			
19									19' 9½"			
20						25' 3"	21' 5"½	18' 1"	19' 11"			
21		26' 5"					21' 1½"					
22							20' 11"		20' 0"			
23									20' 1"	21' 3"		
24							20' 9½"			21' 7"		
25									20' 2"	22' 6½"		
26	26' 1"											
27							19' 9½"			23' 7"		21' 7¼"
28		26' 5"							20' 2"			
29							19' 7"	18' 1"				
30								18' 1"		21' 3"		
31												

Relation between gauge reading and datum:
Zero of gauge = 1,063·0 W.P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A," KEEWATIN, FOR 1906 AND 1907.

1906.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.
1	24′ 7″				20′ 8″	20′10″					25′ 1″	
2				24′ 8″	20′ 7″	20′10″				25′11″	25′ 1″	
3			24′10″		20′ 4½″	20′11½″	21′10½″				25′ 2″	
4					20′ 3″	21′ 1″				25′11½″		
5					20′ 2½″						25′ 3″	
6	24′7½″					21′ 2″						
7				24′6½″		21′ 3″					25′ 2½″	
8											25′ 2½″	
9							21′10½″			25′ 6½″	25′ 5½″	
10					20′ 1½″				22′ 9″		25′ 5½″	
11					20′ 1″	21′ 8″		22′ 2″		25′ 3½″		
12									22′10½″	25′ 3″	25′ 9″	
13						21′ 8″	21′11″			23′10″		
14												
15					20′ 2″	21′ 9″				24′ 7½″	25′10″	
16						21′ 9½″	22′ 1″			24′ 6½″		
17			24′ 8″						23′ 2″	24′ 4½″	25′10½″	
18				24′0½″	20′ 1½″				23′ 5″	24′ 7½″		
19									23′10½″	24′10″		
20						21′ 9″			25′ 1″	24′ 9½″		
21					20′ 3½″							
22					20′ 4″					24′11″		
23					20′ 5″					24′11½″		
24				23′ 0″	20′ 6″					24′11½″		
25				22′ 9″	20′ 7″	21′10½″	22′ 1″			24′11½″		
26				22′ 4″	20′ 9″	21′10½″			25′ 8″	24′11½″		
27	24′ 3″			21′8½″	20′ 9″			22′ 6½″		25′ 1″		
28				21′5½″	20′10″						26′ 1″	
29										25′ 2½″		
30				21′ 0″						25′ 2″		
31										25′ 0″		

1907.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.
1								26′ 5″				
2							25′ 7″		24′ 9″			
3												
4										23′ 0″		
5												
6												
7						26′ 9″	25′ 6″				22′10″	
8												
9									24′ 8″			23′1½″
10						26′ 5″						
11										23′ 0″		
12						26′ 0″		26′ 1″				
13												
14					26′ 7″					22′11″		
15								25′ 7″				
16										22′10″		
17												
18				26′10″								
19								25′ 6″				
20							25′ 8″					
21												
22					26′ 5″		26′ 2″					
23			26′10″									
24						25′ 7″						
25											22′ 10″	
26								24′11″				
27									23′ 4″			
28										22′10″		
29					26′ 5″			24′ 9″				
30				26′10″								
31												

Relation between gauge reading and datum:
Zero of gauge = 1,063·0 W P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A," KEEWATIN, FOR 1908 AND 1909.

1908.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2							21′ 0″		22′ 1″			
3												
4												
5												
6								21′ 6″				
7									23′ 0″			27′ 5″
8												
9									23′ 5″			
10				23′ 0″						24′ 1″		
11												
12			23′6″							24′ 1″		
13												
14					22′ 6″					24′ 7″		
15												
16						21′ 0″						
17												
18									23′11″			
19												
20							21′ 4″					
21												
22												
23											26′ 9″	
24												
25	23′ 7″											
26												
27												
28									23′11″		26′10″	
29												
30												
31												

1909.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1						27′ 0″						
2											26′ 9″	
3		27′ 0″										26′ 9″
4												
5										26′10″		
6							26′11″					
7												
8									26′10″			
9											26′ 6″	
10												
11						26′11″						
12												
13										26′10″		
14												
15												
16									26′ 9″			
17					27′ 1″							
18											26′ 9″	
19												
20					26′ 9″							
21						27′ 2″						
22			27′ 2″									
23				27′ 3″								
24												
25												
26								27′ 0″				
27												
28									26′ 9″			
29	27′ 2″											
30												
31												

Relation between gauge reading and datum:—
Zero of gauge = 1,063·0 W.P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF TAILRACE MILL "A," KEEWATIN, FOR 1910 AND 1911.

1910.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				23′ 9″							27′11″	
2				23′ 2″								
3					20′ 9″							
4											27′11″	
5			26′ 4″									
6										27′ 1″		
7				22′ 0″								
8												
9											28′ 1″	
10							24′ 1″					
11								26′10″				28′ 0″
12			25′11″									
13					20′10″		24′ 9″					
14						22′ 8″						
15									27′ 3″		28′ 0″	
16												
17												
18		26′ 8″										
19										27′ 4″		
20												
21					21′ 0″	21′ 0″						
22							25′10″					
23			26′ 5″									
24								27′ 0″				
25				21′ 9″	21′ 2″							
26												
27							26′ 5″					
28												
29				20′ 9″								
30			25′ 6″									
31												

1911.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												29′ 2″
3												
4							28′ 0″					
5							28′ 0″					
6												
7												
8												
9												
10							28′ 1″					
11												
12												
13							27′10″					29′ 3″
14											28′ 8″	
15		28′ 3″				27′10″						
16												
17												
18							28′ 0″					
19												
20												
21			28′ 3″									
22											29′ 0″	
23	28′ 0″											
24												
25							28′ 0″	27′11″				
26					28′ 0″							
27												
28												
29						28′ 0″						
30												
31	28′ 0″											

Relation between gauge reading and datum:
Zero of gauge = 1,063·0 W.P.S. datum

WINNIPEG RIVER—BELOW FORT ISLAND.

HISTORY.

In 1914, on October 8, a staff gauge was established on the Winnipeg river directly below Old Fort island, by S. C. O'Grady.

RECORDS AVAILABLE.

From the time of installation of this gauge records of gauge readings are available up to December 4 of the same year, when the station was abandoned.

Mean Daily Gauge Height, in Feet, of Winnipeg River below Old Fort Island, for 1914.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov	Dec
1											98·50	98·54
2											98·35	98·64
3											98·43	98·65
4											98·44	98·64[2]
5											98·40	
6											98·39	
7											98·44	
8											98·30	
9										99·96	98·29	
10										100·00	98·51	
11										100·00	98·55	
12										99·94	98·52	
13										99·96	98·54	
14										99·96	98·59	
15										99·57	98·49	
16										99·30	98·37[1]	
17										99·16	98·56	
18										98·90	98·63	
19										98·77	98·62	
20										98·82	98·62	
21										98·84	98·65	
22										98·86	98·50	
23										98·87	98·42	
24										98·73	98·51	
25										98·65	98·53	
26										98·41	98·65	
27										98·52	98·61	
28										98·45	98·62	
29										98·68	98·47	
30										98·78	98·37	
31										98·78	.....	

Relation between gauge reading and datum:—
Zero of gauge = 936·61 W.P.S. datum, Oct. 8.
Zero of gauge = 936·61 W.P.S. datum, Nov. 3.
Zero of gauge = 936·53 W.P.S. datum, Nov. 25.

[1] Frozen at gauge.

[2] Ice 6 inches thick at gauge, and frozen 400 feet out from gauge, channel still open. On Feb. 15, 1915, channel was still open.

LAKE OF THE WOODS, ONTARIO D.P.W. GAUGE AT KEEWATIN.

HISTORY.

This gauge was originally set by the Ontario Department of Public Works. In 1911 it was tied in to W.P.S. datum in connection with Winnipeg River Power Surveys, and from May 1, 1913, gauge readings have been obtained by members of this Survey.

LOCATION.

This staff gauge is secured to a pile on the west side and near the south end of the Keewatin Lake bridge.

RECORDS AVAILABLE.

From May 1, 1913, continuous daily record of gauge readings at this point are available.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF ONT. D.P.W. LAKE GAUGE, KEEWATIN, FOR 1913.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	99·85	99·90	99·54	99·89	99·55	98·94	99·16	99·06
2	......	......	......	......	99·85	99·90	99·62	99·87	99·45	98·90	99·20	99·02
3	......	......	......	......	99·95	99·80	99·78	99·77	99·40	99·00	98·92	99·10
4	......	......	......	......	100·10	100·00	99·49	99·79	99·45	98·79	99·10	99·18
5	......	......	......	......	100·00	99·90	99·38	99·63	99·40	98·44	99·26	99·03
6	......	......	......	......	100·00	99·50	99·62	99·71	99·32	98·82	99·03	99·03
7	......	......	......	......	100·00	99·80	99·62	99·97	99·35	99·07	98·88	98·78
8	......	......	......	......	99·80	99·90	99·63	99·83	99·30	98·81	98·88	98·80
9	......	......	......	......	99·95	100·00	99·23	99·71	99·64	98·88	......	99·06
10	......	......	......	......	100·00	100·06	99·63	99·67	99·33	99·08	98·91	99·02
11	......	......	......	......	100·20	100·08	99·87	99·87	99·30	99·04	99·18	99·03
12	......	......	......	......	100·00	99·98	99·69	99·81	99·19	99·00	98·99	99·01
13	......	......	......	......	99·90	99·89	99·72	99·74	99·15	99·03	99·06	99·03
14	......	......	......	......	100·00	99·90	99·74	99·70	99·47	99·10	99·00	99·05
15	......	......	......	......	99·90	99·88	99·88	99·65	99·20	99·00	99·01	99·02
16	......	......	......	......	100·00	99·90	99·88	99·63	99·10	99·00	99·23	99·04
17	......	......	......	......	99·85	99·72	99·83	99·60	99·12	99·17	99·05	99·01
18	......	......	......	......	99·90	99·81	99·83	99·69	99·30	99·03	98·90	99·02
19	......	......	......	......	99·95	99·69	99·79	99·86	99·37	98·86	99·10	99·00
20	......	......	......	......	99·95	99·69	99·99	99·73	98·60	98·83	99·07	99·00
21	......	......	......	......	99·85	99·70	100·00	99·78	98·52	99·02	98·96	99·04
22	......	......	......	......	99·95	99·78	99·92	99·72	98·98	99·15	98·99	99·02
23	......	......	......	......	100·00	99·98	99·99	99·75	99·00	99·03	99·19	98·99
24	......	......	......	......	99·80	99·85	99·91	99·73	98·71	98·99	99·02	99·01
25	......	......	......	......	100·00	99·77	100·04	99·85	99·90	99·02	98·99	99·00
26	......	......	......	......	100·05	99·58	99·76	99·48	99·98	99·00	98·97	98·99
27	......	......	......	......	99·90	99·43	99·78	99·63	99·02	99·18	99·09	98·98
28	......	......	......	......	99·90	99·70	99·99	99·46	99·08	98·58	99·00	99·04
29	......	......	......	......	99·95	99·81	99·88	99·45	98·85	99·96	98·04	99·03
30	......	......	......	......	99·80	99·84	99·88	99·53	98·99	99·04	99·05	99·00
31	......	......	......	......	100·00	...	99·84	99·48	...	99·12		98·99

Relation between gauge reading and datum:—
Zero of gauge = 959·77 W.P.S., May 1—Dec. 31.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF ONT. D.P.W. LAKE GAUGE, KEEWATIN, FOR 1914 AND 1915

1914.

Day.	Jan.	Feb.	Mar	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	98·98	99·03	99·01	98·87	99·11	99·95	100·00	99·85	99·29	99·41	99·52	99·62
2	98·98	99·01	99·03	98·85	99·15	100·00	100·12	99·85	99·32	99·43	99·79	99·68
3	98·99	99·01	98·98	98·88	99·18	99·93	100·15	99·96	98·91	99·40	99·69	99·65
4	99·02	99·01	98·98	98·87	99·22	99·83	100·15	99·82	99·20	99·35	99·46	99·62
5	99·01	99·02	98·94	98·90	99·23	100·00	100·01	99·84	99·13	99·32	99·52	99·68
6	98·98	99·05	98·93	98·90	99·29	99·92	100·18	99·55	99·09	99·35	99·76	99·70
7	98·99	99·02	98·95	98·84	99·30	99·98	99·80	99·68	99·14	99·28	99·41	99·69
8	98·98	99·06	98·99	98·84	99·40	99·99	100·06	99·63	99·15	99·30	99·74	99·62
9	98·99	99·05	98·99	98·87	99·45	100·10	100·08	99·69	99·28	99·35	99·80	99·68
10	98·99	99·00	98·90	98·80	....	100·20	99·91	99·35	99·25	99·27	99·61	99·70
11	99·04	99·01	98·93	98·83	99·38	100·15	100·00	99·53	99·21	99·40	99·52	99·70
12	98·99	99·02	98·93	98·79	99·45	100·20	100·20	99·58	99·36	99·34	99·59	99·72
13	98·91	99·02	98·95	98·85	99·43	100·20	100·00	99·44	99·55	99·46	99·60	99·69
14	98·98	99·02	98·90	98·82	99·43	100·22	100·02	99·39	99·30	99·69	99·52	99·69
15	98·99	99·05	98·98	98·80	99·50	100·20	100·22	99·50	99·35	99·45	99·50	99·70
16	98·97	99·04	98·90	98·77	99·53	100·25	100·30	99·46	99·31	99·60	99·51	99·72
17	98·99	99·00	98·88	98·80	99·63	100·32	99·82	99·41	99·34	99·47	99·60	99·72
18	99·01	99·01	98·85	98·82	99·63	100·02	100·15	99·35	99·44	99·72	99·58	99·72
19	98·99	99·01	98·86	98·91	99·50	100·18	100·18	99·34	99·49	99·59	99·57	99·73
20	98·97	99·02	98·88	98·92	99·62	100·40	100·18	99·31	99·48	99·58	99·65	99·70
21	98·99	99·01	98·85	98·90	99·63	100·10	100·10	99·30	99·36	99·55	99·49	99·75
22	98·99	99·01	98·87	98·88	99·65	100·30	99·98	99·30	99·20	99·61	99·67	99·72
23	99·00	99·03	98·88	98·93	99·66	100·32	100·04	99·06	99·39	99·33	99·72	99·75
24	99·01	99·02	98·85	98·95	99·79	100·10	100·01	99·19	99·23	99·68	99·65	99·70
25	99·00	99·00	98·80	98·95	99·85	100·01	100·01	99·14	99·42	99·45	99·68	99·72
26	99·00	99·00	98·85	99·08	99·81	100·05	100·10	99·20	99·35	99·36	99·60	99·70
27	98·99	99·01	98·87	99·03	99·80	99·92	99·98	99·28	99·43	99·75	99·65	99·73
28	98·98	98·99	98·87	98·95	99·80	100·10	100·00	99·38	99·40	99·48	99·65	99·73
29	99·01	......	....	98·95	99·80	100·10	100·08	99·35	99·32	99·57	99·69	99·69
30	99·01	.....	98·87	......	99·91	100·10	100·00	99·30	99·40	99·67	99·65	99·70
31	99·02	......	98·86	......	.....	....	99·83	99·30	......	99·65	....	99·69

Relation between gauge reading and datum:—
Zero of gauge = 959·77 W.P.S., Jan. 1— July 3.
Zero of gauge = 959·76 W.P.S., July 4—Dec. 31.

1915.

1	99·72	99·65	99·70	99·61	99·67	99·95	100·63	100·14	99·52	99·28	98·95	99·10
2	99·69	99·67	99·67	99·62	99·76	99·88	100·62	100·13	99·51	99·37	98·97	99·13
3	99·74	99·67	99·68	99·61	99·60	99·84	100·61	100·17	99·60	99·15	99·10	99·08
4	99·74	99·66	99·64	99·60	99·75	99·90	100·47	100·06	99·50	98·85	98·95	99·08
5	99·68	99·68	99·61	99·63	99·77	100·12	100·53	100·04	99·66	99·27	99·20	99·13
6	99·69	99·69	99·60	99·65	99·64	99·75	100·65	100·03	99·50	99·06	99·05	99·08
7	99·67	99·75	99·67	99·67	99·82	99·75	100·65	99·98	99·45	98·75	98·93	99·12
8	99·67	99·75	99·69	99·67	99·39	99·65	100·62	100·00	99·58	98·87	99·05	99·10
9	99·67	99·71	99·65	99·69	99·97	99·85	100·68	100·01	99·47	99·10	98·05	99·13
10	99·75	99·68	99·65	99·70	99·80	99·94	100·73	100·00	99·34	99·20	98·37	99·10
11	99·71	99·67	99·65	99·68	99·94	99·82	100·73	100·02	99·32	99·14	98·02	99·12
12	99·68	99·67	99·65	99·70	99·88	99·88	100·68	99·93	99·40	99·29	98·32	99·13
13	99·71	99·67	99·62	99·65	99·95	99·62	100·69	99·92	99·30	99·18	98·10	99·15
14	99·66	99·72	99·64	99·61	99·94	100·08	100·50	99·85	99·22	99·18	98·05	99·10
15	99·62	99·75	99·63	99·62	99·85	99·96	100·60	99·80	99·43	99·20	98·10	99·12
16	99·61	99·67	99·62	99·67	99·75	99·67	100·60	99·65	99·45	99·18	98·15	99·15
17	99·70	99·68	99·67	99·65	99·85	100·08	100·41	99·80	99·31	99·21	98·20	99·15
18	99·75	99·70	99·58	99·70	99·95	99·98	100·53	99·78	99·11	99·18	98·20	99·15
19	99·67	99·69	99·62	99·70	99·97	100·02	100·50	99·70	99·39	99·28	98·90	99·17
20	99·68	99·69	99·61	99·63	99·93	100·25	100·47	99·69	98·68	99·10	99·10	99·17
21	99·71	99·75	99·65	99·63	99·93	100·28	100·49	99·61	99·22	99·11	98·90	99·17
22	99·69	99·75	99·65	99·61	100·00	100·02	100·53	99·68	99·34	99·10	99·14	99·17
23	99·71	99·67	99·62	99·62	100·07	100·25	100·37	99·75	99·21	99·05	99·10	99·17
24	99·75	99·65	99·65	99·70	99·98	100·23	100·44	99·45	99·10	99·18	99·10	99·17
25	99·75	99·65	99·61	99·80	99·82	100·32	100·15	99·41	99·19	99·25	99·00	99·20
26	99·68	99·65	99·63	99·73	99·98	100·25	100·41	99·61	99·00	98·92	99·10	99·20
27	99·70	99·66	99·61	99·75	100·09	100·18	100·35	99·76	99·22	99·32	99·08	99·20
28	99·65	99·70	99·63	99·75	99·98	100·53	100·35	99·63	99·30	98·95	99·15	99·16
29	99·67		99·65	99·69	99·93	100·15	100·40	99·48	99·27	99·07	99·05	99·16
30	99·67		99·61	99·68	99·94	100·57	100·31	99·66	99·27	99·08	99·10	99·16
31			99·61		99·93		100·21	99·60		99·15		99·16

Relation between gauge reading and datum:—
Zero of gauge = 959·76 W P.S., Jan. 1—Dec. 31.

WINNIPEG RIVER ONTARIO D.P.W. GAUGE AT MILL "A" KEEWATIN.

HISTORY.

This gauge was originally set in place by the Ontario Department of Public Works but was tied in to W.P.S. datum on June 25, 1912, and from June 1, 1913, gauge readings have been taken at this point by members of this Survey.

LOCATION.

This gauge is located on the arm of the Winnipeg river known as Darlington bay and is about 50 feet north of the power house head gates of Mill "A" of the Lake of the Woods Milling Co. at Keewatin.

RECORDS AVAILABLE.

From the 1st of June, 1913, continuous records of gauge readings at this point are available.

Mean Daily Gauge Height, in Feet, of Ont. D.P.W. River Gauge Mill "A", Keewatin, for 1913.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.
1	......	......	......	......	......	80·70	80·67	79·34	78·80	76·21	75·66	75·20
2	......	......	......	......	......	80·65	80·51	79·39	78·80	76·13	....	75·52
3	......	......	......	......	......	80.90	80·75	79·20	78.80	76.06	75.12	75.59
4	......	......	......	......	......	81·00	80·75	79·06	78·85	76·02	75·50	75·63
5	......	......	......	......	......	81·00	80·79	79·30	78·80	75·75	75·55	75·63
6	......	......	......	......	......	81·00	80·39	79·29	78·85	75·61	75·59	75·62
7	......	......	......	......	......	81·00	80·39	79·34	78·65	75·72	75·63	75·50
8	......	......	......	......	......	81·00	80·35	79·35	78·70	75·80	75·68	75·35
9	......	......	......	......	......	80·80	79·94	79·36	78·81	75·81	....	75·56
10	......	......	......	......	......	80·99	79·14	79·12	78·98	75·85	75·20	75·58
11	......	......	......	......	......	81·07	78·98	79·16	78·97	75·85	75·52	75·56
12	......	......	......	......	......	81·11	78·83	79·25	79·90	75·58	75·56	75·61
13	......	......	......	......	......	81·01	78·51	79·28	78·91	75·43	75·60	75·63
14	......	......	......	......	......	80.90	78·25	79·27	78·80	75·65	75·65	75·35
15	......	......	......	......	......	80·70	78·46	79·36	78·76	78·71	75·63	75·15
16	......	......	......	......	......	80·70	78·48	79·39	78·85	75·72	75·11	75·38
17	......	......	......	......	......	80·78	78·45	79·17	78·55	75·72	75·50	75·40
18	......	......	......	......	......	80·92	78·44	79·01	78·87	75·23	75·55	75·56
19	......	......	......	......	......	80·96	78·44	79·08	78·91	75·45	75·61	75·53
20	......	......	......	......	......	80·96	78·43	79·09	78·81	75·25	75·65	75·50
21	......	......	......	......	......	80·95	78·30	79·08	78·53	75·23	75·63	75·24
22	......	......	......	......	......	80·77	78·19	79·05	78·42	75·05	75·67	75·17
23	......	......	......	......	......	80·58	78·19	79·09	78·05	75·58	75·40	75·42
24	......	......	......	......	......	80·75	78·67	78·93	77·60	75·61	75·15	75·50
25	......	......	......	......	......	80·85	78·09	78·98	77·45	75·65	75·50	75·45
26	......	......	......	......	......	80·94	79·21	78·96	77·36	75·50	75·58	75·16
27	......	......	......	......	......	80·81	79·11	78·98	77·18	75·21	75·56	75·52
28	......	......	......	......	......	80·90	78·99	78·99	76·50	75·53	75·60	76·30
29	......	......	......	......	......	80·74	79·24	78·91	76·12	75·61	75·62	75·10
30	......	......	......	......	......	80·75	79·32	79·98	76·30	75·64	75·48	75·50
31	......	......	......	......	......	......	79·36	78·83		75·61		75·55

Relation between gauge reading and datum:—
Zero of gauge = 959·02 W.P.S., June 1—Dec. 31

MEAN DAILY GAUGE HEIGHT, IN FEET, OF ONT. D.P.W. RIVER GAUGE MILL "A", KEEWATIN, FOR 1914 and 1915

1914

Day.	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	75·55	75·33	76·70	76·88	76·97	79·38	80·98	80·85	78·65	78·33	76·50	76·63
2	75·60	75·05	76·48	76·80	76·99	79·64	80·80	80·70	78·58	78·39	76·42	76·72
3	75·60	75·35	76·77	76·80	76·80	80·00	80·90	80·72	78·45	78·31	76·51	76·72
4	75·32	75·45	76·82	76·89	76·76	79·95	80·90	80·84	78·37	78·15	76·55	76·71
5	75·15	75·52	76·81	76·54	77·01	80·00	80·80	80·93	78·37	77·98	76·30	76·73
6	75·37	75·35	76·85	76·42	77·14	80·10	80·80	80·80	78·24	78·20	76·50	76·65
7	75·40	75·35	76·85	76·70	77·25	79·80	80·93	80·81	78·28	78·20	76·53	76·33
8	75·42	75·25	......	76·76	77·32	79·90	80·98	90·83	78·25	78·19	76·40	76·00
9	75·51	75·12	76·60	76·72	77·38	80·20	81·08	80·65	78·31	78·21	76·40	76·50
10	75·55	75·43	76·84	76·55	......	80·40	81·02	80·43	78·38	78·23	76·72	76·55
11	75·35	75·50	76·92	76·60	77·05	80·41	81·03	80·59	78·32	78·32	76·50	76·63
12	75·23	75·51	76·93	76·42	77·34	80·40	80·98	80·62	78·31	78·11	76·65	76·50
13	75·51	75·49	76·93	76·32	77·35	80·42	80·83	80·65	78·21	78·12	76·73	76·35
14	75·63	75·52	76·94	76·47	77·40	90·32	81·03	80·58	78·14	78·31	76·73	76·38
15	75·46	75·40	76·57	76·65	77·42	80·12	81·03	80·60	78·34	77·62	76·30	76·58
16	75·60	75·15	76·39	76·67	77·46	80·40	81·15	80·41	78·42	77·31	76·32	76·52
17	75·52	75·42	76·85	76·57	77·30	80·45	81·14	80·29	78·42	77·22	76·55	76·57
18	75·28	75·48	76·90	76·58	77·23	80·45	81·08	80·48	78·42	77·00	76·55	76·55
19	75·10	75·50	76·93	76·53	77·40	80·60	81·00	80·50	78·49	76·82	76·60	76·54
20	75·33	75·51	76·90	76·60	77·50	80·75	80·94	80·50	78·41	76·98	76·72	76·35
21	75·41	75·65	76·90	76·85	77·52	80·52	81·00	80·55	78·21	77·00	76·72	76·36
22	75·32	75·64	76·64	76·89	78·10	80·45	81·04	80·55	78·39	77·00	76·57	76·55
23	75·27	75·55	76·51	80·83	78·33	80·72	81·08	80·25	78·48	77·00	76·32	76·55
24	75·27	76·10	76·79	76·73	78·17	80·83	81·04	80·38	78·42	76·90	76·62	76·59
25	75·14	76·34	76·85	76·72	78·26	81·02	81·05	80·09	78·19	76·60	76·65	76·35
26	75·09	76·62	76·88	76·63	78·45	81·10	80·98	79·67	78·48	76·28	76·69	76·59
27	75·35	76·70	76·88	76·57	78·60	81·07	80·87	79·20	78·23	76·65	76·72	76·30
28	75·42	76·80	76·88	76·85	79·10	80·92	81·05	79·03	78·10	76·58	76·71	76·35
29	75·45	...	...	76·90	79·40	80·82	81·02	78·85	78·28	76·68	76·60	76·50
30	......	.....	76·58	76·90	79·55	81·05	81·07	78·78	78·31	76·80	76·34	76·52
31	......	....	76·84	.....	.....	......	81·01			76·82		76·59

1915

Day.	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76·35	76·47	76·38	76·38	79·43	80·64	81·90	82·50	77·90	77·29	76·00	76·63
2	76·40	76·76	76·65	76·30	79·20	80·64	81·95	82·39	78·05	77·15	76·60	76·63
3	76·36	76·75	76·69	76·28	79·10	80·63	82·03	82·50	78·08	76·78	76·61	76·63
4	76·30	76·74	76·69	....	79·43	80·62	82·00	82·48	78·03	76·58	76·60	76·61
5	76·57	76·80	76·69	76·14	79·43	80·67	82·00	82·47	77·90	76·84	76·63	76·35
6	76·62	76·81	76·70	76·15	79·38	80·45	82·06	82·45	77·72	76·90	76·63	76·16
7	76·68	76·55	76·46	76·15	79·52	80·13	82·07	82·45	77·92	76·80	76·55	76·48
8	76·70	76·45	76·32	76·49	79·45	80·57	82·28	82·37	77·96	76·73	76·62	76·49
9	76·70	76·75	76·62	77·78	79·40	80·60	82·35	82·30	77·95	76·80	76·70	76·46
10	76·43	76·76	76·68	78·22	79·10	80·67	82·42	82·05	77·95	76·59	76·65	76·54
11	76·35	76·80	76·57	78·31	79·17	80·70	82·31	82·00	77·92	76·50	76·65	76·57
12	76·63	76·79	76·48	78·33	79·24	80·72	82·25	81·98	77·74	76·65	76·70	76·56
13	76·66	76·81	78·42	78·69	79·53	80·54	82·40	81·91	77·59	76·70	76·65	76·57
14	76·73	76·53	76·23	78·77	79·55	80·55	82·35	81·95	77·80	76·70	76·65	76·63
15	76·74	76·47	76·19	78·87	79·53	80·65	82·33	81·84	77·90	76·71	76·66	76·63
16	76·74	76·78	76·28	78·99	79·45	80·67	82·35	81·75	77·98	76·70	76·70	76·65
17	76·53	76·78	76·29	79·02	79·24	80·70	82·31	81·80	77·90	76·46	76·70	76·65
18	76·41	76·78	76·29	78·90	79·80	80·73	82·22	81·80	77·85	76·47	76·70	76·68
19	76·67	76·83	76·29	78·75	80·42	80·77	82·16	81·71	77·72	76·56	76·65	76·67
20	76·76	76·79	76·30	79·05	81·17	80·65	82·27	81·60	77·65	76·60	76·67	76·58
21	76·78	76·55	76·12	79·22	81·50	80·76	82·28	81·11	77·78	76·60	76·60	76·65
22	76·81	76·45	76·11	79·18	81·40	80·70	82·27	80·00	77·80	76·61	76·62	76·68
23	76·82	76·75	76·22	79·28	80·87	81·11	82·25	79·68	77·78	76·60	76·65	76·70
24	76·50	76·80	76·22	79·39	80·76	80·95	82·22	79·33	77·78	76·60	76·63	76·65
25	76·45	76·78	76·28	79·28	80·77	81·01	82·32	79·21	77·89	76·67	76·65	76·39
26	76·73	76·80	76·35	79·20	80·77	81·05	82·32	78·58	77·66	76·64	76·65	76·12
27	76·83	76·83	76·35	79·39	80·79	80·93	82·52	78·40	77·58	76·67	76·65	76·40
28	76·84	76·45	76·18	79·38	80·77	81·09	82·59	78·27	77·80	76·65	76·63	76·55
29	76·85	...	...	79·42	80·75	81·20	82·65	78·03	77·85	76·67	76·50	76·60
30	76·82	....	76·45	79·42	80·67	81·67	82·65	77·98	77·87	76·67	76·62	76·65
31	.	.	76·51	.....	80·56	....	82·61	77·90	...	76·65	......	76·65

Relation between gauge reading and datum:—
Zero of gauge = 959·02 W.P.S., Jan. 1—Dec. 31, 1914.
Zero of gauge = 959·03 W.P.S., Jan. 1—Dec. 31, 1915.
Gauge moved on 13th April, carried away on 9th May, replaced on 10th May, 1915

WEST BRANCH WINNIPEG RIVER, TAILRACE NORMAN DAM.

HISTORY.

The staff gauge in the tailrace of the Norman dam was originally set in place by the Ontario Department of Public Works, but the taking of records on same was discontinued in 1907 or 1908. In October of 1913 the gauge was tied in to W.P.S. datum, and records have been taken since that time by this Survey.

LOCATION.

This staff gauge is secured to the north side of a timber crib at the lower end of the fish-way at the southerly end of the rock fill section of the Norman dam.

RECORDS AVAILABLE.

Records of daily readings on this gauge are available for the year 1913 from October 8 to the end of the year, with the exception of one day in October and six days in November. For the year 1914 the record is complete with the exception of ten days in September, and for 1915 with the exception of four days in December.

Mean Daily Gauge Height in Feet, of West Branch Winnipeg River at Tailrace, Norman Dam, for 1913.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.
1											34·79	34·50
2												34·72
3											34·40	34·75
4											34·68	34·77
5											34·72	34·77
6											34·71	34·74
7												34·57
8										35·00	34·78	34·47
9										34·97		34·59
10										34·99	34·38	34·67
11											34·62	34·70
12										34·77	34·69	34·77
13										34·62	34·72	34·77
14										34·82	34·74	34·38
15										34·90	34·72	34·37
16										34·92	34·60	34·47
17										34·90	34·71	34·52
18										34·92	34·67	34·67
19										34·92	34·70	34·65
20										34·40	34·73	34·38
21										34·49	34·76	34·41
22										34·75	34·82	34·48
23										34·77		34·53
24										34·79	34·44	34·61
25										34·82	34·69	34·59
26										34·61	34·72	34·45
27										34·69	34·76	34·64
28										34·68	34·69	34·35
29										34·75	34·83	34·40
30										34·77		34·57
31										34·78		34·60

Relation between gauge reading and datum:—
Zero of gauge = 1,000·00 W.P.S., datum

MEAN DAILY GAUGE HEIGHT, IN FEET, OF WEST BRANCH WINNIPEG RIVER AT TAILRACE, NORMAN DAM, FOR 1914 AND 1915.

1914

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34·64	34·24	35·62	35·92	36·10	38·62	40·11	40·00	37·80	37·46	35·67	35·92
2	34·72	34·30	35·69	35·94	36·10	38·79	40·11	39·76	37·85	37·50	35·86	35·97
3	34·67	34·50	35·92	35·96	35·94	39·10	40·11	39·86	37·79	37·50	35·74	36·00
4	34·52	34·55	36·02	35·90	35·90	39·16	40·07	40·06	37·77	37·21	35·81	35·97
5	34·39	34·51	36·03	35·57	36·15	39·19	39·88	40·11	37·73	37·27	35·82	35·79
6	34·55	34·33	36·02	35·61	36·33	39·12	39·89	40·08	37·50	37·31	35·75	35·56
7	34·54	34·47	36·02	35·80	36·43	39·17	39·97	40·08	37·64	37·27	35·68	35·80
8	34·56	34·50	35·80	35·88	36·50	39·27	40·03	40·08	37·54	37·18	35·51	35·72
9	34·65	34·45	35·87	35·84	36·58	39·50	40·07	39·71	....	37·10	35·77	35·72
10	34·70	34·60	36·02	35·82	36·47	39·56	40·11	39·78	....	36·95	35·82	35·73
11	34·47	34·67	36·07	35·82	36·49	39·59	40·11	39·86	....	36·81	35·82	35·72
12	34·42	34·70	36·07	35·47	36·58	39·59	39·86	39·90	....	36·73	35·82	35·72
13	34·60	34·64	36·08	35·44	36·69	39·59	39·96	39·87	....	36·70	35·82	35·97
14	34·67	34·58	36·07	35·55	36·70	39·47	40·15	39·78	....	36·67	35·82	35·97
15	34·63	34·38	35·82	35·67	36·68	39·44	40·26	39·69	37·66	36·61	35·72	35·77
16	34·67	34·43	35·82	35·71	36·65	39·67	40·30	39·47	37·64	36·60	35·80	35·72
17	34·60	34·64	35·95	35·67	36·42	39·72	40·31	39·49	37·61	36·33	35·92	35·77
18	34·40	34·68	36·07	35·68	36·44	39·79	40·29	39·61	37·62	36·07	36·12	35·67
19	34·40	34·72	36·07	35·77	36·59	39·78	40·06	39·61	37·63	36·18	35·97	35·75
20	34·48	34·74	36·03	35·89	36·73	39·73	40·08	39·57	....	36·20	36·07	35·85
21	34·47	34·87	36·02	35·89	36·89	39·69	40·12	39·55	....	36·41	35·95	35·65
22	34·42	34·87	35·80	35·90	37·40	39·67	40·12	39·54	....	36·45	35·70	35·70
23	34·55	34·79	35·77	35·90	37·50	39·85	40·11	39·45	....	36·20	35·71	35·70
24	34·46	35·24	35·90	35·87	37·30	40·02	40·08	39·51	37·52	36·20	35·82	35·67
25	34·37	35·67	35·97	35·82	37·45	40·12	39·97	39·53	37·63	35·85	35·86	35·65
26	34·33	35·84	35·98	36·00	37·62	40·14	39·88	39·29	37·65	35·77	35·82	35·70
27	34·47	35·87	36·03	36·00	37·85	40·08	39·92	38·98	37·25	35·87	35·82	35·63
28	34·50	35·97	36·01	36·00	38·22	40·13	40·11	38·53	37·25	35·83	35·82	35·56
29	34·60	....	35·82	36·00	38·57	40·13	40·11	38·36	37·37	35·85	35·60	35·74
30	34·62	....	35·77	36·00	38·76	40·09	40·08	37·96	37·41	35·90	35·62	35·70
31	34·47	....	35·92	....	38·66	....	40·05	38·12	....	35·90	......	35·70

1915

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	35·65	35·76	35·74	35·60	38·45	39·70	40·95	41·37	37·30	36·40	35·86	35·77
2	35·70	35·90	35·85	35·60	38·22	39·70	40·98	41·39	37·20	36·45	35·80	35·77
3	35·62	35·90	35·89	35·50	38·24	39·78	41·10	41·50	37·10	36·11	35·75	35·77
4	35·57	35·90	35·90	35·35	38·30	39·80	40·95	41·55	37·15	36·15	35·77	35·77
5	35·68	35·95	35·93	35·32	38·35	39·80	41·04	41·60	37·00	36·20	35·80	......
6	35·70	36·00	35·95	35·40	38·40	39·55	41·15	41·60	37·04	36·17	35·83	......
7	35·80	35·64	35·59	35·50	38·45	39·56	41·20	41·60	37·12	36·13	35·82	......
8	35·89	35·71	35·75	36·50	38·45	39·60	41·25	41·45	37·15	36·08	35·80	......
9	35·90	35·90	35·80	37·10	38·23	39·60	41·28	41·53	37·15	36·00	35·80	35·55
10	35·72	35·92	35·85	37·45	38·29	39·65	41·40	41·35	37·12	35·83	35·80	35·65
11	35·65	35·95	35·90	37·45	38·35	39·70	41·22	41·10	37·10	35·88	35·81	35·68
12	35·80	35·95	35·80	37·57	38·45	39·75	41·43	41·00	36·99	35·88	35·83	35·68
13	35·86	36·00	35·70	37·80	38·55	39·52	41·45	41·00	36·99	35·84	35·82	35·69
14	35·90	35·68	35·45	37·90	38·50	39·59	41·45	41·00	37·00	35·80	35·81	35·75
15	35·90	35·82	35·44	38·00	38·50	39·60	41·45	40·87	37·00	35·78	35·80	35·77
16	35·90	35·92	35·40	38·10	38·31	39·60	41·45	40·83	37·00	35·78	35·80	35·80
17	35·68	35·95	35·45	38·10	38·25	39·60	41·40	40·75	37·00	35·54	35·80	35·80
18	35·70	36·00	35·50	37·50	39·35	39·60	41·15	40·65	37·00	35·62	35·80	35·80
19	36·00	36·00	35·55	37·80	40·00	39·60	41·20	40·60	36·87	35·68	35·80	35·75
20	35·90	36·00	35·50	38·10	40·15	39·44	41·40	40·30	36·95	35·70	35·80	35·75
21	35·95	35·72	35·30	38·20	40·00	39·71	41·50	39·55	36·95	35·70	35·77	35·75
22	36·00	35·78	35·27	38·30	39·90	39·70	41·40	39·12	36·90	35·72	35·76	35·77
23	35·95	35·90	35·35	38·42	39·82	40·20	41·42	38·56	36·90	35·80	35·75	35·77
24	35·71	35·95	35·37	38·48	39·74	40·15	41·25	38·10	36·90	35·59	35·75	35·75
25	35·71	35·95	35·38	38·22	39·80	40·15	41·25	37·80	36·90	35·68	35·77	35·35
26	35·90	36·00	35·40	38·30	39·90	40·10	41·45	37·60	36·67	35·85	35·77	35·25
27	36·05	36·00	35·43	38·38	39·80	39·95	41·57	37·32	36·66	35·85	35·77	35·58
28	36·00	35·60	35·34	38·45	39·80	40·02	41·60	37·15	36·75	35·85	35·77	35·70
29	36·00	......	35·50	38·50	39·80	40·40	41·62	37·03	36·85	35·85	35·77	35·75
30	36·00	......	35·65	38·50	39·63	40·95	41·62	37·27	36·55	35·85	35·77	35·77
31	35·67	......	35·70	......	39·67	......	41·62	37·40	......	35·85	......	35·77

Relation between gauge reading and datum.—
Zero of gauge = 1,000·00 W.P.S. datum.

WESTERN OUTLET, LAKE OF THE WOODS (FOREBAY, NORMAN DAM).

HISTORY.

The staff gauge in the forebay of the Norman dam was originally set by the Ontario Department of Public Works. In June of 1913 the gauge was tied in to W.P.S. datum, and observations have been made on this gauge since that time by this Survey.

LOCATION.

This gauge is secured to the upstream side of the crib at the head of the fishway located at the southerly end of the rock fill section of the Norman dam.

RECORDS AVAILABLE.

During the year 1912, dating from June 6 and in 1913 to September 20, the readings available for this gauge are scattered, but from this latter date to the end of 1915 practically continuous daily readings are available.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF WESTERN OUTLET, LAKE OF THE WOODS FOREBAY, NORMAN DAM, FOR 1912 AND 1913.

1912

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4										98·67		
5												
6						97·00						
7												
8												
9												
10									98·02			
11									98·16	98·80		
12									98·22	98·83		
13								97·82	98·22		98·65	
14								97·68			98·83	
15												
16									98·23		98·70	
17									98·22			
18										98·81		
19									98·27			
20												
21						97·03						
22									98·32			
23												
24												
25												
26									98·40			
27							97·53					
28							97·49					
29								97·92				
30							97·48					
31												

1913

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				98·76				98·06	58·06	58·42	58·73	58·67
2							97·00			58·51		58·69
3									57·92	58·46	58·57	58·71
4										58·33	58·74	58·73
5									57·92	58·03	58·79	58·63
6								97·92		58·41	58·63	58·58
7												58·55
8								98·00		58·48	58·56	58·65
9									58·11	58·42		58·64
10										58·75	58·52	58·62
11							98·53			58·68	58·75	58·64
12		98·38								58·54	58·52	58·61
13										58·73	58·57	58·62
14										58·69	58·62	58·63
15										58·56	58·65	58·61
16				98·95						58·60		58·63
17				99·00						58·71	58·63	58·64
18										58·61	59·49	58·61
19										58·48	58·66	58·64
20									57·32	58·40	58·67	58·59
21					97·00				57·42	58·59	58·57	58·60
22									57·87	58·75	58·56	58·60
23									58·29	58·69		58·59
24									58·25	58·55	58·53	58·60
25									58·27	58·58	58·46	58·59
26						96·82		58·00	58·26	58·53	58·53	58·58
27								58·12	58·54	58·75	58·67	58·59
28								57·96	58·52	58·77	58·57	58·61
29								57·98	58·37	58·52	58·65	58·59
30								58·06	58·50	58·62		58·59
31										58·73		58·59

Relation between gauge reading and datum:—
Zero of gauge = 960·27 W.P.S., June 6, 1912.
Zero of gauge = 960·28 W.P.S., Nov. 14, 1912.
Zero of gauge = 960·28 W.P.S., March 5, 1913.
Zero of gauge = 960·29 W.P.S., June 12, 1913.
Zero of gauge = 1,000·00 W.P.S., Aug. 26—Dec 31.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF WESTERN OUTLET, LAKE OF THE WOODS FOREBAY, NORMAN DAM, FOR 1914 AND 1915.

1914

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	58·59	58·55	58·20	58·13	58·38	58·18	57·60	57·38	58·24	58·40	58·87	59·00
2	58·57	58·50	58·24	58·14	58·42	58·21	57·60	57·38	58·28	58·39	58·85	58·99
3	58·54	58·55	58·20	58·13	58·44	58·23	57·53	57·36	58·30	58·35	58·85	58·97
4	58·56	58·60	58·18	58·13	58·47	58·27	57·48	57·32	58·35	58·31	58·85	58·93
5	58·59	58·58	58·20	58·15	58·50	58·29	57·42	57·30	58·41	58·30	58·87	58·97
6	58·59	58·59	58·21	58·14	58·54	58·23	57·40	57·30	58·46	58·31	58·86	59·00
7	58·57	58·59	58·23	58·13	58·57	58·22	57·39	57·29	58·51	58·32	58·82	58·00
8	58·58	58·62	58·09	58·13	58·59	58·22	57·43	57·25	58·54	58·47	58·87	58·96
9	58·58	58·59	58·24	58·13	58·63	58·24	57·46	57·25	57·59	58·64	59·15	58·97
10	58·57	58·58	58·25	58·13	58·63	58·34	57·50	57·21	57·62	58·82	59·13	59·00
11	58·58	58·59	58·28	58·15	58·61	58·34	57·50	57·21	58·65	58·90	59·10	59·00
12	58·56	58·57	58·28	58·10	58·60	58·33	57·50	57·20	57·62	58·93	59·07	59·00
13	58·54	58·59	58·23	58·12	58·60	58·36	57·53	57·20	57·53	58·95	59·05	59·00
14	58·57	58·59	58·28	58·10	58·66	58·39	57·59	57·20	57·45	59·00	59·12	59·00
15	58·50	58·58	58·23	58·10	58·73	58·31	57·61	57·20	57·39	59·05	59·17	59·00
16	58·51	58·58	58·28	58·10	58·77	58·26	57·60	57·20	58·32	59·05	59·13	59·00
17	58·54	58·59	58·25	58·11	58·80	58·16	57·58	57·23	58·28	58·88	58·95	59·05
18	58·57	58·58	58·21	58·17	58·77	58·11	57·57	57·03	58·29	58·98	58·87	59·01
19	58·52	58·58	58·18	58·18	58·77	58·17	57·57	57·01	58·29	58·93	59·10	58·95
20	58·53	58·57	58·20	58·20	58·80	58·19	57·58	57·01	58·31	58·98	59·00	59·17
21	58·60	58·54	58·18	58·17	58·66	58·20	57·57	56·97	58·31	58·93	58·95	59·10
22	58·59	58·45	58·18	58·16	58·50	58·20	57·54	56·94	58·32	58·92	59·05	59·10
23	58·57	58·42	58·18	58·16	58·54	58·15	57·52	56·91	58·34	58·83	59·03	59·10
24	58·60	58·39	58·18	58·17	58·59	57·90	57·50	56·87	58·35	59·00	59·00	59·00
25	58·59	58·30	58·18	58·19	58·59	57·66	57·50	56·86	58·37	58·80	59·00	59·10
26	58·57	58·26	58·17	58·26	58·57	57·55	57·46	57·25	58·38	58·83	59·00	59·10
27	58·53	58·27	58·14	58·36	58·45	57·58	57·42	57·86	58·40	58·92	59·00	59·10
28	58·54	58·23	58·14	58·37	58·28	57·60	57·39	58·27	58·40	58·98	59·00	59·11
29	58·55	......	58·14	58·37	58·23	57·60	57·39	58·64	58·40	58·97	59·00	59·14
30	58·59	......	58·13	58·36	58·20	57·60	57·38	58·23	58·40	58·99	59·00	59·10
31	58·60	....	58·13	......	58·13	.... .	57·38	58·23	...	59·01		59·10

1915

1	59·10	59·08	59·00	58·90	58·25	57·50	56·85	55·70	58·32	58·70	58·65	58·56
2	59·06	59·10	59·05	58·90	58·25	57·50	56·85	55·70	58·38	58·87	58·62	58·56
3	59·05	59·07	59·03	58·90	58·27	57·50	56·85	55·70	58·45	59·00	58·59	58·56
4	59·01	59·10	59·00	58·97	58·30	57·48	56·81	55·70	58·50	59·00	58·63	58·56
5	59·00	59·12	59·00	59·02	58·30	57·45	56·87	55·68	58·50	59·00	58·65	
6	59·00	59·15	59·00	59·10	58·40	57·41	56·90	55·65	58·50	58·95	58·72	
7	59·03	59·13	59·00	59·00	58·45	57·40	56·95	55·65	58·48	59·90	58·75	
8	59·11	59·10	59·02	58·25	58·50	57·40	56·95	55·57	58·46	58·83	58·77	
9	59·09	59·15	59·08	58·25	58·50	57·40	56·98	55·97	58·48	58·76	58·78	58·56
10	59·10	59·12	59·03	58·30	58·46	57·15	56·98	56·20	58·50	58·73	58·78	58·54
11	59·11	59·10	59·00	58·22	58·40	57·50	56·99	56·40	58·52	58·69	58·75	58·54
12	59·11	59·10	59·00	58·25	58·45	57·55	56·99	56·35	58·55	58·65	58·61	58·57
13	59·13	59·10	59·00	58·25	58·50	57·55	57·00	56·25	58·55	58·62	58·60	58·58
14	59·05	59·10	59·00	58·25	58·18	57·60	57·00	56·10	58·45	58·65	58·58	58·58
15	59·10	59·10	58·92	58·20	58·45	57·60	57·03	56·00	58·33	58·65	58·57	58·56
16	59·10	59·12	58·95	58·20	58·41	57·60	56·93	55·87	58·20	58·63	58·58	58·61
17	59·10	59·15	58·95	58·20	58·37	57·80	56·90	56·10	58·25	58·60	58·58	58·63
18	59·10	59·15	58·95	58·20	57·50	57·90	56·86	56·20	58·28	58·57	58·56	58·65
19	59·10	59·15	58·95	58·20	56·25	57·60	56·90	56·30	58·31	58·52	58·56	58·63
20	59·10	59·12	58·95	58·25	55·90	57·61	56·90	56·50	58·35	58·48	58·56	58·62
21	59·05	59·11	58·95	58·30	56·50	57·65	56·90	57·72	58·35	58·47	58·56	58·61
22	59·02	59·11	58·95	58·32	56·90	57·55	56·94	58·28	58·40	58·49	58·55	58·61
23	59·02	59·10	58·95	58·35	57·57	57·65	56·95	58·47	58·10	58·55	58·54	58·61
24	59·00	59·12	58·95	58·37	57·52	57·55	56·60	58·55	58·12	58·63	58·55	58·65
25	59·06	59·12	59·95	58·39	57·50	57·55	56·26	58·58	58·15	58·71	58·55	58·55
26	59·10	59·12	58·95	58·35	57·60	57·68	55·90	58·60	58·19	58·77	58·56	58·65
27	59·15	59·12	58·95	58·28	57·60	57·80	55·78	58·55	58·27	58·78	58·56	58·60
28	59·10	59·00	58·95	58·25	57·50	57·96	55·75	58·50	58·45	58·77	58·56	58·61
29	59·10	......	59·02	58·20	57·50	57·25	55·73	58·42	58·48	58·76	58·56	58·61
30	59·10	......	59·05	58·25	57·50	56·85	55·70	58·34	58·58	58·77	58·56	58·65
31	59·09	......	59·05		57·50	.	55·70	58·25		58·75		58·66

Relation between gauge reading and datum:
Zero of gauge = 1,000 00 W P S , datum

KEEWATIN RIVER BRIDGE.

HISTORY.

The gauge at Keewatin river bridge was established on June 28, 1912, by S. S. Scovil, at the time of the establishment of a metering section on the Winnipeg river at north side of Tunnel island.

LOCATION.

This gauge is located on an up-stream pile at the south end of the Keewatin river bridge, which is located one mile west of the metering section above referred to.

RECORDS AVAILABLE.

From the time of the installation of the gauge, daily readings have been taken, with the exception of December, 1912, and January, February and part of March, 1913, when readings were taken once a week.

MEAN DAILY GAUGE HEIGHT, IN FEET, OF WEST BRANCH WINNIPEG RIVER AT KEEWATIN RIVER BRIDGE, FOR 1912 AND 1913.

1912

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1							72·28	72·87	73·03	73·57	76·09	76·06
2							72·23	72·88	72·98	73·60	76·06	75·62
3							72·55	72·91	73·13	73·63	76·01	76·08
4							72·62	72·66	73·25	73·92	75·94	
5							72·62	72·60	73·32	74·52	76·12	
6							72·67	72·81	73·28	74·61	76·04	
7							72·48	72·94	73·27	74·76	75·91	76·15
8							72·51	72·97	73·08	75·01	75·45	
9							72·57	72·99	73·03	75·05	75·33	
10							72·58	73·00	73·18	75·16	74·85	
11							72·61	72·82	73·23	75·28	74·83	
12							72·67	72·75	73·24	75·36	75·28	
13							72·72	72·95	73·31	75·21	75·65	
14							72·45	73·01	73·40	75·18	75·83	76·12
15							72·47	73·07	73·28	75·37	75·88	
16							72·60	73·09	73·21	75·48	75·91	
17							72·68	73·10	73·31	75·62	75·81	
18							72·72	72·95	73·34	75·88	75·82	
19							72·72	72·88	73·36	75·98	75·88	
20							72·76	73·48	73·37	75·84	75·90	
21							72·50	73·78	73·40	75·83	75·97	76·10
22							72·46	73·12	73·28	76·02	76·04	
23							72·65	73·17	73·22	76·04	76·14	
24							72·75	73·20	73·33	76·12	75·53	
25							72·82	73·02	73·39	76·07	75·51	
26							72·84	73·18	73·46	76·06	76·09	
27							72·70	73·08	73·52	75·93	76·15	
28							72·50	73·11	73·57	75·83	76·29	76·12
29						72·77	72·74	72·16	73·47	76·00	76·25	
30						72·47	72·85	73·21	73·47	76·04	76·24	
31							72·87	73·23	.....	76·12	..	

1913

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1	...	76·08	..	73·75	78·23	79·94	79·87	78·58	78·03	75·40	74·82	74·50
2				73·80	78·29	79·93	79·78	78·61	78·02	75·30	74·57	74·71
3				73·78	78·37	80·09	79·97	79·42	78·02	75·24	74·49	74·77
4	76·15			73·72	78·28	80·16	79·98	78·40	78·03	75·19	74·69	74·80
5				73·72	78·24	80·22	79·94	78·50	78·01	74·95	74·75	74·82
6				73·60	78·44	80·25	79·74	78·49	78·02	74·76	74·75	74·81
7				73·68	78·56	80·22	79·64	78·53	77·92	74·96	74·79	74·55
8		75·90		73·70	78·56	80·09	79·45	78·59	77·88	74·99	74·82	74·53
9				73·80	78·59	80·02	78·94	78·56	77·99	74·98	74·60	74·69
10			73·70	73·84	78·64	80·16	78·27	78·36	78·02	75·01	74·52	74·75
11	76·00		74·00	73·82	78·45	80·22	78·14	78·36	78·05	74·98	74·70	74·79
12			74·05	73·80	78·42	80·29	78·91	78·46	78·02	74·76	74·77	74·80
13			74·08	73·69	78·80	80·28	77·73	78·48	78·02	74·63	74·80	74·80
14			74·10	73·65	79·14	80·19	77·54	78·45	77·94	74·83	74·82	74·52
15		75·12	74·10	73·75	79·56	79·98	77·62	78·55	77·93	74·89	74·82	74·47
16			73·90	73·81	79·70	79·97	77·64	78·57	78·01	74·90	74·60	74·67
17			73·72	73·93	79·74	80·10	77·62	78·39	78·02	74·90	74·70	74·68
18	76·00		73·98	74·05	79·69	80·13	77·61	78·25	78·07	74·92	74·73	74·70
19			74·02	74·11	79·72	80·15	77·57	78·26	78·14	74·69	74·79	74·70
20			74·10	73·95	79·79	80·15	77·32	78·29	78·03	74·82	74·82	74·69
21			74·12	73·94	79·84	80·11	77·29	78·32	77·74	74·53	74·82	74·47
22			74·12	75·08	79·93	80·02	77·39	78·30	77·55	74·74	74·82	74·46
23			73·90	75·84	80·26	79·86	77·47	78·27	77·11	74·79	74·59	74·67
24			73·73	76·65	79·90	79·98	77·96	78·16	76·77	74·80	74·19	74·70
25	76·90		73·90	77·28	79·80	80·08	78·37	78·11	76·03	74·81	74·70	74·48
26			73·88	77·60	79·82	80·09	78·13	78·14	76·50	74·59	[illegible]	74·46
27			73·88	77·55	79·92	80·07	78·27	78·16	76·24	74·52	74·78	74·47
28			73·87	77·66	79·94	80·08	78·25	78·17	75·00	74·73	[illegible]	74·42
29			73·84	77·99	79·99	79·96	78·42	78·13	75·10	74·79	74·82	74·47
30			73·72	78·14	80·04	79·92	78·52	78·14	75·18	74·80	[illegible]	[illegible]
31			73·62		80·08		78·58	78·03		74·81		74·72

Relation between gauge reading and datum:—
Zero of gauge = 959·86 W.P.S. datum, July 1—December 31
Zero of gauge = 959·86 W.P.S. datum, Jan. 1—July 17
Zero of gauge = 959·88 W.P.S. datum, July 17—Dec. 31

MEAN DAILY GAUGE HEIGHT, IN FEET, OF WEST BRANCH WINNIPEG RIVER AT KEEWATIN RIVER BRIDGE, FOR 1914 AND 1915.

1914.

Day	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.
1	34·62	34·31	35·68	35·79	35·96	38·55	40·01	39·99	37·69	37·39	35·57	35·70
2	34·65	34·25	35·65	35·84	36·00	38·72	39·85	39·76	37·65	37·38	35·49	35·75
3	34·67	34·43	35·79	35·88	35·86	39·05	39·90	39·80	37·48	37·38	35·57	35·77
4	34·48	34·51	35·80	35·90	35·86	39·07	39·90	39·95	37·41	37·23	35·55	35·77
5	34·36	34·56	35·82	35·73	36·04	39·10	39·87	40·00	37·37	37·11	35·51	35·79
6	34·45	34·41	35·84	35·70	36·15	39·06	39·86	39·91	37·32	37·21	35·52	35·73
7	34·47	34·38	35·88	35·79	36·32	38·89	39·93	39·88	37·31	37·23	35·51	35·56
8	34·51	34·30	35·74	35·82	36·40	38·99	40·07	39·88	37·32	37·23	35·42	35·64
9	34·58	34·33	35·72	35·77	36·38	39·33	40·14	39·70	37·35	37·26	35·46	35·62
10	34·65	34·50	35·90	35·64	36·23	39·48	40·12	39·60	37·41	37·33	35·63	35·61
11	34·47	34·55	35·96	35·64	36·22	39·48	40·11	39·69	37·35	37·34	35·65	35·61
12	34·40	34·58	36·01	35·53	36·40	39·50	40·00	39·71	37·36	37·16	35·67	35·68
13	34·52	34·59	36·03	35·50	36·47	39·54	39·98	39·71	37·25	37·18	35·71	35·53
14	34·62	34·60	36·03	35·64	36·50	39·39	40·14	39·68	37·24	37·22	35·73	35·51
15	34·63	34·43	35·82	35·77	36·52	39·35	40·19	39·67	37·37	36·63	35·59	35·63
16	34·61	34·34	35·76	35·73	36·45	39·50	40·23	39·53	37·42	36·40	35·53	35·64
17	34·58	34·49	35·92	35·58	36·21	39·52	40·28	39·43	37·42	36·24	35·68	35·65
18	34·35	34·53	35·98	35·61	36·31	39·55	40·30	39·55	37·42	36·02	35·70	35·60
19	34·24	34·58	35·98	35·55	36·47	39·68	40·13	39·60	37·49	35·89	35·67	35·61
20	34·42	34·59	36·00	35·61	36·57	39·83	40·07	39·62	37·45	36·03	35·69	35·49
21	34·48	34·69	36·00	35·83	36·79	39·73	40·19	39·66	37·38	36·05	35·69	35·47
22	34·41	34·69	35·79	35·91	37·25	39·59	40·22	39·67	37·43	36·06	36·56	35·60
23	34·35	34·81	35·72	35·83	37·33	39·79	40·24	39·44	37·47	36·01	35·49	35·60
24	34·34	35·31	35·86	35·74	37·20	39·90	40·24	39·34	37·45	35·92	35·62	35·61
25	34·19	35·44	35·92	35·72	37·30	40·02	40·13	39·43	37·48	35·73	35·68	35·55
26	34·21	35·58	35·95	35·64	37·53	40·15	39·92	39·12	37·48	35·52	35·70	35·51
27	34·45	35·73	35·95	35·65	37·87	40·13	39·88	38·64	37·23	35·69	35·71	35·42
28	34·50	35·85	35·92	35·80	38·25	40·02	40·06	38·24	37·10	35·72	35·70	35·45
29	34·53		35·78	35·87	38·48	39·98	40·10	38·09	37·28	35·76	35·50	35·56
30	34·51	.	35·67	35·95	38·66	40·05	40·12	37·89	37·31	35·86	35·51	35·63
31	34·55	.	35·77		38·66	.....	40·12	37·77	..	35·86	....	35·65

1915

Day	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.
1	35·48	35·61	35·56	35·41	38·47	39·71	40·92	41·53	37·00	36·30	35·65	35·67
2	35·48	35·78	35·74	35·34	38·42	39·72	40·98	41·47	37·09	36·16	35·63	35·66
3	35·52	35·82	35·75	35·35	38·20	39·69	41·09	41·56	37·10	35·83	35·64	35·67
4	35·49	35·82	35·76	35·24	38·38	39·67	41·09	41·53	37·05	35·62	35·66	35·65
5	35·61	35·84	35·77	35·17	38·41	39·65	41·17	41·51	36·94	35·84	35·66	35·39
6	35·66	35·84	35·77	35·20	38·44	39·55	41·20	41·49	36·78	35·91	35·65	35·28
7	35·71	35·65	35·61	35·29	38·53	39·55	41·29	41·47	36·93	35·87	35·63	35·51
8	35·75	35·60	35·51	35·96	38·50	39·62	41·40	41·38	36·97	35·85	35·64	35·51
9	35·76	35·81	35·72	36·91	38·36	39·69	41·45	41·30	36·96	35·84	35·69	35·49
10	35·62	35·82	35·76	37·32	38·28	39·75	41·48	41·14	36·97	35·62	35·72	35·55
11	35·53	35·85	35·60	37·38	38·43	39·75	41·40	41·04	36·94	35·55	35·71	35·60
12	35·70	35·85	35·53	37·50	38·53	39·73	41·36	40·99	36·78	35·69	35·70	35·57
13	35·75	35·85	35·50	37·74	38·58	39·59	41·44	40·97	36·70	35·73	35·67	35·60
14	35·79	35·65	35·34	37·86	38·62	39·61	41·41	40·98	36·84	35·74	35·65	35·67
15	35·79	35·62	35·30	37·95	38·61	39·69	41·40	40·89	36·92	35·74	35·69	35·69
16	35·80	35·83	35·35	38·03	38·41	39·72	41·39	40·79	36·95	35·73	35·71	35·73
17	35·62	35·84	35·33	38·09	38·40	39·71	41·37	40·83	36·95	35·52	35·72	35·77
18	35·56	35·85	35·33	37·96	39·03	39·77	41·28	40·79	36·93	35·51	35·73	35·77
19	35·76	35·88	35·34	37·94	39·70	39·77	41·26	40·74	36·75	35·61	35·73	35·70
20	35·81	35·84	35·35	38·15	40·28	39·70	41·38	40·55	36·66	35·61	35·72	35·66
21	35·84	35·67	35·22	38·18	40·54	39·76	41·33	39·91	36·77	35·62	35·69	35·73
22	35·83	35·60	35·18	38·24	40·35	39·90	41·31	39·07	36·86	35·64	35·69	35·74
23	35·83	35·80	35·26	38·33	39·94	39·99	41·29	38·66	36·88	35·66	35·69	35·74
24	35·66	35·83	35·31	38·44	39·80	40·01	41·27	38·35	36·85	35·65	35·67	35·69
25	35·62	35·85	35·35	38·28	39·82	40·05	41·37	38·02	36·89	35·69	35·67	35·42
26	35·82	35·86	35·38	38·21	39·82	40·02	41·45	37·58	36·71	35·69	35·67	35·15
27	35·84	35·86	35·38	38·42	39·81	39·99	41·57	37·41	36·63	35·69	35·65	35·45
28	35·86	35·61	35·24	38·46	39·82	40·09	41·65	37·24	36·84	35·70	35·62	35·59
29	35·87		35·29	38·48	39·81	40·35	41·69	37·07	36·88	35·71	35·63	35·64
30	35·86		35·50	38·49	39·67	40·67	41·68	37·08	36·73	35·71	35·65	35·72
31	35·67		35·53		39·65		41·65	36·98		35·67		35·74

Relation between gauge reading and datum:—
Zero of gauge = 1,000·00 W.P.S. datum, Jan. 1—Dec. 31, 1914, 1915

KENORA POWER HOUSE, EAST BRANCH WINNIPEG RIVER HEAD AND TAILRACE GAUGES.

HISTORY.

The present tailrace gauge of the Kenora Power House was set in place by the employees of the Power House in the Fall of 1910.

The headrace gauge was set in place in August of 1907, though the location has been slightly changed since that time.

On June 24, 1912, both of these gauges were tied in to W.P.S. datum and records of daily gauge height have been taken since May 1, 1913, by members of this Survey.

LOCATION.

The tailrace gauge at the Kenora Power House is located about fifty feet downstream from the easterly end of the generator room.

The headrace gauge is placed at the easterly end of the forebay about thirty feet above the rocks at the head gates of the plant.

RECORDS AVAILABLE.

From May 1, 1913, continuous daily dauge readings on these two gauges are available.

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR MAY, JUNE, JULY AND AUGUST, 1913.

	May				July			
Day.	Headrace Gauge.	Tailrace Gauge	Head in feet.	Discharge c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.
1	98·27	76·35	21·92	1,230	98·35	77·86	20·49	713
2	98·28	76·39	21·89	1,217	98·15	77·66	20·49	930
3	98·31	76·41	21·90	1,219	98·20	78·01	20·19	1,369
4	98·54	76·18	22·36	679	97·90	77·98	19·92	1,353
5	98·41	76·16	22·25	898	97·80	77·81	19·99	820
6	98·36	76·54	21·82	1,170	98·02	77·66	20·36	701
7	98·40	76·69	21·71	1,206	98·07	77·50	20·57	738
8	98·20	76·69	21·51	1,192	98·03	77·61	20·42	1,211
9	98·33	76·72	21·61	1,202	97·68	77·30	20·38	1,296
10	98·42	76·78	21·64	1,197	98·07	77·18	20·89	1,267
11	98·61	76·52	22·09	725	98·23	76·49	21·74	1,233
12	98·39	76·41	21·98	945	98·13	76·33	21·80	1,233
13	98·21	76·81	21·40	1,257	98·17	75·92	22·25	726
14	98·37	77·17	21·20	1,267	98·14	75·87	22·27	1,009
15	98·33	77·52	20·81	1,280	98·29	76·00	22·29	1,207
16	98·40	77·70	20·70	1,287	98·25	76·01	22·24	1,216
17	98·30	77·82	20·48	1,301	98·23	75·98	22·25	1,216
18	98·31	77·68	20·63	763	98·25	76·00	22·25	1,238
19	98·36	77·60	20·76	708	98·18	75·98	22·20	925
20	98·34	77·60	20·74	744	98·28	74·40	23·88	602
21	98·16	77·81	20·35	1,110	98·43	75·30	23·13	653
22	98·34	77·90	20·44	1,290	98·38	75·29	23·09	657
23	98·41	77·95	20·46	1,304	98·21	75·37	22·84	658
24	98·15	77·81	20·34	783	98·29	76·05	22·24	861
25	98·90	77·68	21·22	685	98·46	76·39	22·07	846
26	98·46	77·71	20·75	718	98·33	76·53	21·80	890
27	98·46	77·77	20·69	735	98·23	76·20	22·03	643
28	98·28	77·89	20·39	1,045	98·38	76·40	21·98	848
29	98·28	77·91	20·37	1,278	98·31	76·60	21·71	927
30	98·22	77·97	20·25	1,330	98·34	76·69	21·65	909
31	98·35	78·00	20·35	1,274	98·30	76·70	21·60	821

	June				August			
1	98·24	77·86	20·38	771	98·32	76·70	21·62	845
2	98·36	77·78	20·58	879	98·30	76·60	21·70	874
3	98·16	78·08	20·08	1,314	98·18	76·37	21·81	665
4	98·42	78·20	20·22	1,300	98·20	76·50	21·70	860
5	98·31	78·20	20·11	1,314	98·04	76·40	21·64	711
6	97·92	78·26	19·66	1,352	98·15	76·37	21·78	697
7	98·23	78·21	20·02	1,326	98·37	76·36	22·01	689
8	98·37	78·05	20·32	767	98·29	76·50	21·79	682
9	98·48	77·87	20·61	907	98·14	76·49	21·65	715
10	98·52	78·20	20·32	1,291	98·11	76·23	21·88	681
11	98·49	78·26	20·23	1,297	98·31	76·20	22·11	714
12	98·58	78·15	20·23	834	98·15	76·38	21·77	700
13	98·31	78·10	20·21	742	98·21	76·32	21·89	690
14	98·37	78·02	20·35	728	98·12	76·37	21·75	697
15	98·33	77·93	20·40	699	98·03	76·49	21·54	709
16	98·28	77·80	20·48	734	98·07	76·48	21·59	713
17	98·12	77·99	20·13	1,115	98·02	76·33	21·69	697
18	98·22	78·10	20·12	1,319	98·01	76·18	21·83	697
19	98·16	78·18	19·98	1,325	98·17	76·20	21·97	702
20	98·11	78·12	19·99	1,331	98·10	76·21	21·89	694
21	98·08	78·11	19·94	1,331	98·09	76·21	21·88	687
22	98·17	77·92	20·25	785	98·02	76·29	21·73	706
23	98·32	77·87	20·45	1,104	98·07	76·20	21·87	697
24	98·24	77·98	20·26	1,227	98·09	76·05	22·04	677
25	98·18	78·10	20·08	1,316	98·14	76·09	22·05	688
26	97·96	78·11	19·85	1,342	97·94	76·10	21·84	694
27	97·81	78·07	19·74	1,400	98·06	76·03	22·03	705
28	98·07	78·11	19·96	1,348	97·90	76·11	21·79	695
29	98·08	77·92	20·16	782	97·90	76·08	21·82	701
30	98·30	77·91	20·39	737	98·01	76·06	21·95	699
31					97·90	75·95	21·95	666

Relation between gauge reading and datum:—
Zero of headrace and tailrace guages = 961·365 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR SEPTEMBER, OCTOBER, NOVEMBER AND DECEMBER, 1913.

	SEPTEMBER				NOVEMBER			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.
1	98·04	75 89	22 15	672	58 87	36·32	22·55	1,345
2	97 83	75 95	21 88	689	58 64	35 54	23·10	715
3	97 77	75 91	21·83	699	58 73	35·90	22 83	1,130
4	97 98	75 98	22 00	704	58 85	36·32	22 53	1,315
5	97 98	75 95	22 03	702	58 95	36 32	22·63	1,310
6	97 80	75 98	21 82	695	58 74	36 32	22 42	1,330
7	97 71	75 88	21 83	661	58·53	36 44	22 09	1,370
8	97 72	75 80	21 92	692	58 58	36 42	22 16	1,375
9	98 06	75 88	22·18	697	58·71	35 46	23·25	735
10	97 87	76 03	21 84	703	58 66	35 82	22 84	1,135
11	97 77	76 05	21 72	717	58 92	36·31	22 61	1,355
12	97 63	76 03	21 60	727	58 71	36·31	22 40	1,335
13	97 62	76 00	21 62	728	58 80	36·33	22 47	1,370
14	97 83	75·90	21 93	674	58 72	36·40	22·32	1,350
15	97 68	75 82	21 86	698	58·80	36·33	22 47	1,370
16	97 56	75 95	21 61	727	59 02	35·49	23·53	695
17	97 61	75·99	21 62	733	58 71	36·42	22 29	1,390
18	97 74	75 98	21 76	720	58·82	36.32	22.50	1,350
19	97 81	76·12	21 69	813	58·82	36·38	22·44	1,385
20	97 00	76 29	20 71	1,210	58 62	36 38	22 24	1,370
21	96·94	75 85	21 09	786	58·82	35 74	23 08	1,055
22	97 30	75 98	21 32	1,159	58 88	35 64	23 24	1,330
23	97 39	75 77	21 62	1,339	58 97	35 40	23 57	720
24	97 29	75 50	21 79	1,348	58·75	36 34	22 41	1,225
25	97 30	75 40	21 90	1,325	58·70	36·34	22 36	1,360
26	97 38	75 30	22 08	1,320	58 73	36 42	22 31	1,390
27	97 42	75·20	22 22	1,313	58 79	36 41	22·38	1,395
28	58 91	35 65	23·26	709	58 71	36 38	22 33	1,375
29	58 53	36·32	22 21	1,120	58 79	36 44	22 35	1,400
30	58 70	36 38	22 32	1,241	58 80	35 45	23 35	740

	OCTOBER				DECEMBER			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.
1	58 59	36·35	22 24	1,305	58 75	36 34	22 41	1,235
2	58 62	36 38	22 24	1,310	58 73	36 43	22 30	1,380
3	58 68	36 31	22 34	1,300	58 78	36 45	22 33	1,405
4	58 52	36 33	22 19	1,335	58 80	36 40	22 40	1,390
5	58 27	35 40	22 87	735	58 74	36 38	22 36	1,375
6	58 57	35 76	22 81	1,065	58 75	36 43	22 32	1,415
7	58 91	36 31	22 60	1,305	58 51	35 54	22 97	825
8	58 52	36 32	22 20	1,350	58 80	36 45	22 35	1,275
9	58 58	36 33	22 25	1,335	58 76	36 32	22 44	1,390
10	58 85	36 33	22 52	1,240	58 72	36 47	22 25	1,410
11	58 83	36 36	22 47	1,310	58 72	36 40	22 32	1,105
12	58 74	35 31	23 43	690	58 71	36 38	22·33	1,105
13	58 88	36 30	22 58	1,145	58 71	36 40	22 31	1,270
14	58 81	36 31	22 50	1,340	58 82	35 52	23 30	710
15	58 71	36 36	22 35	1,350	58 77	35 90	22 87	835
16	58 71	36 38	22 33	1,350	58 84	35 51	23 33	805
17	58 92	36 35	22 57	1,290	58 78	35 94	22 84	1,130
18	58 73	36 42	22 31	1,355	58 72	36 42	22 30	1,355
19	58 64	35 40	23 24	720	58 73	35 93	22 80	945
20	58 54	35 88	22 66	1,160	58 75	35 90	22 85	1,015
21	58 71	36 38	22 33	1,395	58 78	35 68	23 10	930
22	58 92	36 33	22 59	1,345	58 70	35 94	22 76	900
23	58 71	36 40	22 31	1,375	58 70	36 42	22 28	1,330
24	58 72	36 36	22 36	1,345	58 70	36 54	22 16	1,180
25	58 72	36 46	22 26	1,370	58 71	35 76	22 95	1,070
26	58 73	35 36	23 37	765	58 70	36 43	22 27	1,350
27	58 76	35 92	22 84	1,150	58 68	36 42	22 26	1,455
28	58 30	36 45	21 85	1,415	58 73	35 71	23 02	1,000
29	58 67	36 43	22 24	1,375	58 72	35 94	22 78	1,290
30	58 78	36 42	22 36	1,380	58 71	36 47	22 24	1,440
31	58 82	36 34	22 48	1,355	58 67	36 53	22 14	1,495

Relation between gauge reading and datum:
Zero of headrace and tailrace gauges = 961 365 W P S datum Sept 27 and 1,000 00 W P S datum Sept 28 and October

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR JANUARY, FEBRUARY, MARCH AND APRIL, 1914.

	January				March			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace. Gauge.	Head in feet.	Discharge. c. f. s
1	58·64	36·49	22·15	1,430	58·76	35·80	22·96	940
2	58·66	36·46	22·20	1,420	58·76	36·40	22·37	1,205
3	58·64	36·42	22·22	1,395	58·78	36·50	22·28	1,145
4	58·60	35·60	23·00	935	58·75	36·50	22·25	1,115
5	58·72	35·98	22·74	920	58·60	36·52	22·08	1,130
6	58·70	35·81	22·89	880	58·62	36·50	22·12	1,100
7	58·73	35·68	23·05	840	58·63	36·52	22·11	1,140
8	58·68	36·32	22·36	1,225	58·66	35·84	22·82	810
9	58·68	36·41	22·27	1,395	58·62	36·52	22·10	1,230
10	58·70	36·43	22·27	1,380	58·58	36·52	22·06	1,255
11	58·72	35·85	22·87	1,080	58·63	36·57	22·06	1,260
12	58·70	36·43	22·27	1,330	58·59	36·52	22·07	1,230
13	58·68	36·48	22·20	1,515	58·63	36·51	22·12	1,180
14	58·68	36·41	22·27	1,385	58·64	36·47	22·17	1,135
15	58·68	36·30	22·38	1,315	58·70	35·74	22·96	700
16	58·68	35·91	22·77	1,045	58·62	36·07	22·55	830
17	58·71	35·81	22·90	910	58·55	36·51	22·04	1,180
18	58·73	35·52	23·21	810	58·56	36·38	22·18	1,130
19	58·72	35·71	23·01	795	58·58	36·40	22·48	890
20	58·67	35·80	22·87	895	58·53	36·48	22·05	1,125
21	58·73	35·87	22·86	945	58·53	36·50	22·03	1,135
22	58·68	35·83	22·85	970	58·61	35·84	22·77	800
23	58·67	35·79	22·88	945	58·55	36·46	22·00	1,085
24	58·60	35·50	23·10	1,005	58·54	36·50	22·04	1,075
25	58·73	35·62	23·11	925	58·47	36·54	21·93	980
26	58·70	35·90	22·80	965	58·57	36·03	22·54	880
27	58·72	35·79	22·93	965	58·56	35·98	22·58	865
28	58·69	35·90	22·79	965	58·60	35·97	22·63	815
29	58·76	35·93	22·83	995	58·60	35·73	22·87	710
30	58·76	35·90	22·86	1,025	58·59	35·84	22·75	720
31	58·80	35·88	22·92	1,025	58·60	35·70	22·90	710
	February				April			
1	58·78	35·83	22·95	945	58·61	35·72	22·89	710
2	58·74	35·76	22·98	885	58·61	35·72	22·89	740
3	58·74	35·78	22·96	960	58·64	35·83	22·81	775
4	58·77	35·94	22·83	985	58·62	35·86	22·76	805
5	58·74	35·92	22·82	1,030	58·62	35·72	22·90	735
6	58·75	35·93	22·82	1,005	58·63	35·72	22·91	790
7	58·75	35·93	22·82	1,060	58·53	35·88	22·65	855
8	58·80	35·72	23·08	955	58·57	35·87	22·70	830
9	58·76	35·93	22·83	1,045	58·61	35·83	22·78	765
10	58·74	35·90	22·84	1,075	58·61	35·58	23·03	700
11	58·76	35·92	22·84	1,100	58·62	35·78	22·84	770
12	58·74	35·94	22·80	1,085	58·51	35·67	22·84	735
13	58·76	35·87	22·89	1,070	58·56	35·70	22·86	750
14	58·76	35·92	22·84	1,045	58·55	35·71	22·84	725
15	58·73	35·67	23·06	960	58·52	36·20	22·32	890
16	58·75	35·88	22·87	995	58·53	36·42	22·11	920
17	58·74	35·81	22·93	1,000	58·50	36·35	22·15	935
18	58·76	35·81	22·95	955	58·50	36·29	22·21	970
19	58·76	35·85	22·91	1,010	58·64	35·60	23·04	685
20	58·76	35·91	22·85	1,035	58·64	36·37	22·27	935
21	58·77	35·87	22·90	1,015	58·67	36·37	22·30	855
22	58·75	35·82	22·93	1,000	58·71	35·76	22·95	685
23	58·75	35·90	22·85	1,050	58·71	35·72	22·99	690
24	58·80	35·86	22·94	995	58·74	35·70	23·04	685
25	58·74	35·89	22·85	935	58·78	35·66	23·12	685
26	58·75	35·84	22·91	890	58·82	35·51	23·31	640
27	58·78	35·95	22·83	880	58·78	35·71	23·07	685
28	58·78	36·45	22·33	1,180	58·71	35·78	22·93	710
29					58·80	35·84	22·96	690
30	...				58·84	35·74	23·10	680

Relation between gauge reading and datum:—
Zero of headrace and tailrace gauges = 1,000·00 W.P.S. datum.

Mean Daily Gauge Height, in Feet, and Mean Daily Discharge, in Feet per Sec. of East Branch Winnipeg River at Kenora Power House, for May, June, July and August, 1914.

	May				July			
Day	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.
1	58·88	35·75	23·13	670	59·75	39·41	20·34	705
2	58·92	35·66	23·26	660	59·95	39·27	20·68	710
3	58·92	35·64	23·28	650	59·90	39·31	20·59	720
4	58·93	35·57	23·36	645	59·81	39·33	20·48	765
5	58·96	35·74	23·22	670	59·84	39·36	20·48	800
6	59·02	36·50	23·52	840	59·98	39·28	20·70	760
7	59·03	36·52	23·51	845	59·59	39·36	20·23	760
8	59·12	36·54	23·58	805	59·83	39·50	20·33	940
9	59·15	36·64	23·51	850	59·84	39·50	20·34	725
10	59·05	35·92	23·13	645	59·68	39·58	20·10	965
11	59·10	36·53	22·57	915	59·72	39·62	20·10	805
12	59·17	36·60	22·57	960	59·87	39·43	20·44	675
13	59·16	36·69	22·47	955	59·73	39·30	20·43	715
14	59·14	36·68	22·46	940	59·85	39·43	20·42	720
15	59·27	36·22	23·05	690	59·98	39·50	20·48	725
16	59·24	36·71	22·53	915	60·07	39·60	20·47	735
17	59·40	35·87	23·53	630	59·61	39·57	20·04	760
18	59·37	36·04	23·33	655	59·88	39·73	20·15	1,005
19	59·30	36·57	22·73	870	59·87	39·50	20·37	675
20	59·34	36·72	22·62	865	59·87	39·58	20·29	900
21	59·33	36·73	22·60	890	59·91	39·50	20·41	740
22	59·36	37·08	22·28	895	59·77	39·53	20·24	750
23	59·40	37·23	22·17	915	59·86	39·56	20·30	740
24	59·54	36·66	22·88	625	59·82	39·54	20·28	740
25	59·58	36·72	22·86	645	59·85	39·54	20·31	725
26	59·52	37·31	22·21	895	59·87	39·33	20·54	675
27	59·54	37·45	22·09	890	59·72	39·32	20·40	730
28	59·57	37·73	21·84	860	59·85	39·54	20·31	740
29	59·54	38·06	21·48	870	59·88	39·45	20·43	750
30	59·65	38·23	21·42	895	59·75	39·50	20·25	770
31	59·66	38·02	21·64	650	59·63	39·47	20·16	755

	June				August			
Day	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge c. f. s.
1	59·67	38·10	21·57	860	59·71	39·46	20·25	755
2	59·72	38·34	21·38	910	59·58	39·17	20·41	690
3	59·68	38·68	21·00	915	59·78	39·17	20·61	750
4	59·56	38·68	20·88	880	59·58	39·31	20·27	955
5	59·74	38·71	21·03	935	59·54	39·54	20·00	975
6	59·71	38·71	21·00	900	59·31	39·50	19·81	990
7	59·73	38·33	21·40	630	59·46	39·27	20·19	750
8	59·71	38·54	21·17	870	59·50	39·28	20·22	750
9	59·87	38·91	20·96	880	59·46	39·11	20·35	685
10	59·98	39·10	20·88	885	59·10	38·95	20·15	745
11	59·88	39·10	20·78	915	59·30	39·07	20·23	755
12	59·94	39·10	20·84	880	59·34	39·10	20·24	755
13	59·94	39·12	20·82	965	59·23	39·10	20·13	760
14	60·02	38·88	21·14	635	59·13	39·07	20·06	755
15	59·91	38·90	21·01	870	59·13	39·06	20·07	755
16	60·02	39·07	20·95	860	59·12	38·92	20·20	705
17	60·09	39·12	20·97	860	59·12	38·92	20·20	765
18	59·74	39·14	20·60	885	59·11	38·93	20·18	785
19	59·94	39·23	20·71	885	59·06	39·12	19·94	990
20	60·16	39·32	20·84	865	59·07	39·20	19·87	1,245
21	59·88	39·08	20·80	660	59·02	39·24	19·78	1,255
22	60·03	39·13	20·90	925	59·07	39·20	19·87	1,010
23	60·10	39·30	20·80	1,045	58·72	38·90	19·82	720
24	59·90	39·48	20·42	1,000	58·92	38·90	20·02	1,260
25	59·73	39·64	20·09	1,000	58·82	39·07	19·75	1,340
26	59·78	39·70	20·08	1,015	58·88	38·89	19·99	1,090
27	59·63	39·68	19·95	995	58·98	38·52	20·46	1,240
28	59·84	39·45	20·39	675	59·07	38·13	20·94	1,220
29	59·87	39·30	20·57	720	59·14	37·77	21·37	725
30	59·87	39·44	20·43	735	59·02	37·49	21·53	675
					59·07	37·48	21·59	725

Relation between gauge reading and datum:—
Zero of headrace and tailrace gauges = 1,000·00 W.P.S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR SEPTEMBER, OCTOBER, NOVEMBER AND DECEMBER, 1914.

	SEPTEMBER				NOVEMBER			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet	Discharge. c. f. s.
1	58·98	37·58	21·40	990	59·26	35·52	23·74	651
2	58·94	37·28	21·66	710	59·50	35·78	23·72	867
3	58·68	37·12	21·56	710	59·44	36·30	23·14	927
4	58·98	36·98	22·00	700	59·30	36·29	23·01	940
5	58·88	37·30	21·58	990	59·28	36·28	23·00	934
6	58·80	36·82	21·98	665	59·41	36·31	22·10	945
7	58·85	37·28	21·57	940	59·12	36·39	22·73	958
8	58·88	37·28	21·60	1,180	59·48	35·57	23·91	702
9	59·03	37·29	21·74	980	59·45	35·87	23·58	744
10	59·01	37·30	21·71	1,090	59·37	36·31	23·06	983
11	59·00	36·93	22·07	720	59·27	36·34	22·93	957
12	59·10	37·27	21·83	890	59·32	36·36	22·96	970
13	59·26	36·80	22·46	650	59·32	36·37	22·95	955
14	58·94	37·16	21·78	1,180	59·25	36·34	22·91	963
15	59·11	37·28	21·83	990	59·50	35·71	23·79	747
16	59·13	37·30	21·83	1,150	59·32	35·89	23·43	938
17	59·03	37·30	21·73	940	59·31	36·34	22·97	1,015
18	59·18	37·32	21·86	1,160	59·28	36·39	22·89	1,044
19	59·25	37·32	21·93	860	59·31	36·37	22·94	1,035
20	59·20	36·90	22·30	635	59·36	36·39	22·97	1,034
21	59·18	37·15	22·03	900	59·30	36·37	22·93	984
22	58·92	37·37	21·55	1,115	59·41	35·70	23·71	745
23	59·14	37·34	21·80	875	59·47	35·88	23·59	944
24	58·90	37·34	21·56	1,100	59·42	36·26	23·16	964
25	59·12	37·35	21·77	890	59·41	36·21	23·20	1,102
26	59·14	37·32	21·82	810	59·36	36·31	23·05	948
27	59·14	36·77	22·37	655	59·34	36·35	22·99	995
28	59·10	37·10	22·00	885	59·38	36·31	23·07	956
29	59·02	37·25	21·77	895	59·47	35·36	24·11	672
30	59·13	37·26	21·87	905	59·41	35·77	23·64	909

	OCTOBER				DECEMBER			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet	Discharge. c. f. s.
1	59·18	37·24	21·94	870	59·38	36·33	23·05	959
2	59·25	37·25	22·00	870	59·44	36·39	23·05	999
3	59·14	37·27	21·87	910	59·42	36·34	23·08	1,003
4	59·14	36·72	22·42	630	59·42	36·36	23·06	972
5	59·02	37·02	22·00	1,090	59·44	36·34	23·10	974
6	59·08	37·15	21·93	1,295	59·48	35·68	23·80	706
7	58·96	37·13	21·83	1,295	59·42	35·77	23·65	893
8	59·02	37·17	21·85	1,315	59·34	36·32	23·02	1,007
9	59·08	37·14	21·94	1,305	59·37	36·30	23·07	1,013
10	58·92	37·24	21·68	1,360	59·41	36·30	23·11	1,122
11	59·24	36·89	22·35	695	59·42	36·33	23·09	1,026
12	59·02	36·74	22·28	645	59·40	36·35	23·05	1,010
13	59·19	36·81	22·38	1,000	59·48	35·67	23·81	779
14	59·36	37·29	22·07	1,330	59·42	36·39	23·03	1,098
15	59·28	36·86	22·42	1,260	59·45	36·42	23·03	1,116
16	59·34	36·67	22·67	1,265	59·46	36·43	23·03	1,232
17	59·16	36·64	22·52	1,280	59·47	36·42	23·05	1,086
18	59·49	35·82	23·67	680	59·44	36·43	23·01	1,062
19	59·34	35·90	23·44	960	59·43	36·40	23·03	1,068
20	59·32	36·48	22·84	1,256	59·49	35·70	23·79	817
21	59·02	36·02	23·24	1,030	59·43	36·31	23·12	1,216
22	59·30	36·50	22·80	1,255	59·44	36·46	22·98	1,124
23	59·08	35·90	23·18	725	59·43	36·40	23·03	1,234
24	59·36	35·74	23·62	650	59·43	36·43	23·00	1,147
25	59·32	35·66	23·66	615	59·48	35·85	23·63	881
26	59·03	35·69	23·34	680	59·46	35·89	23·57	921
27	59·48	35·76	23·72	710	59·52	35·71	23·81	814
28	59·23	35·76	23·47	690	59·41	36·40	23·01	1,121
29	59·32	36·30	23·02	1,020	59·43	36·37	23·06	1,198
30	59·37	36·34	23·03	1,035	59·44	36·42	23·02	1,224
31	59·42	36·37	23·05	870	59·44	36·37	23·07	1,093

Relation between gauge reading and datum:—
Zero of headrace and tailrace gauges = 1,000·00 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR JANUARY, FEBRUARY, MARCH AND APRIL, 1915.

JANUARY

Day.	Headrace Gauge	Tailrace Gauge.	Head in feet.	Discharge. c. f. s
1	59·44	35·79	23·65	836
2	59·44	35·95	23·49	869
3	59·49	35·69	23·80	824
4	59·48	35·98	23·50	837
5	59·48	35·89	23·59	829
6	59·40	36·32	23·08	1,034
7	59·41	36·33	23·08	1,076
8	59·43	36·32	23·11	1,051
9	59·42	36·34	23·08	1,020
10	59·47	35·72	23·75	773
11	59·46	36·28	23·18	1,032
12	59·46	36·33	23·13	1,014
13	59·47	36·34	23·13	1,155
14	59·45	36·39	23·06	1,061
15	59·41	36·40	23·01	1,072
16	59·40	36·39	23·01	1,030
17	59·48	35·75	23·73	793
18	59·47	35·99	23·48	1,010
19	59·43	36·40	23·03	1,154
20	59·42	36·49	22·93	1,174
21	59·45	36·44	23·01	1,208
22	59·43	36·48	22·95	1,206
23	59·45	36·43	23·02	1,113
24	59·47	35·80	23·67	824
25	59·43	36·44	22·99	1,208
26	59·44	36·46	22·98	1,146
27	59·42	36·52	22·90	1,252
28	59·42	36·49	22·93	1,245
29	59·42	36·46	22·96	1,213
30	59·42	36·49	22·93	1,185
31	59·47	35·71	23·76	730

MARCH

Day.	Headrace Gauge.	Tailrace. Gauge.	Head in feet.	Discharge. c. f. s.
1	59·46	35·75	23·71	897
2	59·40	36·34	23·06	1,040
3	59·38	36·35	23·03	1,020
4	59·39	36·34	23·05	980
5	59·36	36·35	23·01	1,109
6	59·37	36·33	23·04	1,000
7	59·39	35·61	23·78	672
8	59·40	36·27	23·13	1,107
9	59·37	36·35	23·02	1,109
10	59·37	36·35	23·02	1,092
11	59·37	36·29	23·08	925
12	59·37	36·31	23·06	919
13	59·36	36·28	23·08	880
14	59·40	35·37	24·03	664
15	59·39	35·39	24·00	658
16	59·41	35·34	24·07	652
17	59·42	35·35	24·07	652
18	59·33	35·38	23·95	658
19	59·43	35·40	24·03	672
20	59·40	35·43	23·97	681
21	59·39	35·40	23·99	668
22	59·40	35·37	24·03	668
23	59·43	35·50	23·93	664
24	59·38	35·50	23·88	684
25	59·37	36·24	23·13	961
26	59·42	36·28	23·14	960
27	59·37	36·23	23·14	789
28	59·41	35·49	23·92	672
29	59·38	35·70	23·68	871
30	59·38	35·60	23·78	693
31	59·34	36·33	23·01	875

FEBRUARY

Day.	Headrace Gauge	Tailrace Gauge.	Head in feet.	Discharge. c. f. s
1	59·38	36·39	22·99	1,162
2	59·43	36·43	23·00	1,180
3	59·42	36·39	23·03	1,024
4	59·43	36·40	23·03	1,122
5	59·41	36·43	22·98	1,156
6	59·45	36·43	23·02	982
7	59·47	35·71	22·76	720
8	59·43	36·35	22·08	1,451
9	59·43	36·40	22·03	1,067
10	59·44	36·39	22·05	1,120
11	59·40	36·38	22·02	998
12	59·41	36·38	22·03	1,131
13	59·44	36·39	22·05	915
14	59·50	35·72	22·78	689
15	59·47	36·27	22·20	1,099
16	59·46	36·34	22·12	991
17	59·42	36·34	22·08	1,092
18	59·46	36·38	22·08	1,082
19	59·43	36·43	22·00	1,063
20	59·47	36·35	22·12	965
21	59·49	35·70	22·79	680
22	59·44	35·81	22·63	1,012
23	59·41	36·34	22·07	1,084
24	59·40	36·34	22·06	946
25	59·37	36·36	22·01	1,085
26	59·39	36·40	22·99	1,104
27	59·37	36·41	22·96	957
28	59·45	35·61	23·81	675
29				

APRIL

Day.	Headrace Gauge.	Tailrace. Gauge.	Head in feet.	Discharge. c. f. s.
1	59·37	35·64	23·73	678
2	59·38	35·48	23·90	642
3	59·36	36·39	22·97	910
4	59·43	35·34	24·09	626
5	59·38	36·28	23·10	873
6	59·42	36·33	23·09	868
7	59·41	36·27	23·14	873
8	59·41	36·29	23·12	870
9	59·41	36·49	22·92	1,009
10	59·43	36·98	22·45	889
11	59·47	36·65	22·82	625
12	59·45	36·87	22·58	839
13	59·43	37·38	22·05	885
14	59·41	37·47	21·94	1,029
15	59·39	37·62	21·77	1,042
16	59·39	37·68	21·71	1,064
17	59·43	37·72	21·71	893
18	59·44	37·41	22·03	635
19	59·41	37·63	21·78	1,078
20	59·37	37·82	21·55	1,131
21	59·42	37·87	21·55	1,113
22	59·37	37·94	21·43	1,121
23	59·39	37·99	21·40	1,116
24	59·39	37·87	21·52	910
25	59·49	37·74	21·75	652
26	59·38	37·92	21·46	1,112
27	59·50	38·08	21·42	1,107
28	59·51	38·21	21·30	1,119
29	59·48	38·18	21·30	1,094
30	59·42	38·18	21·24	1,115

Relation between gauge reading and datum:—
Zero of headrace and tailrace gauges = 1,000·00 W. P. S. datum

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR MAY, JUNE, JULY AND AUGUST, 1915.

	May				July			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.
1	59·42	38·17	21·25	810	60·43	40·09	20·34	679
2	59·52	37·73	21·79	636	60·35	40·31	20·04	940
3	59·43	37·64	21·79	1,014	60·32	40·43	19·89	879
4	59·51	38·06	21·45	1,080	60·28	40·28	20·00	693
5	59·53	38·07	21·46	1,083	60·30	40·26	20·04	853
6	59·40	38·09	21·31	1,097	60·35	40·50	19·85	943
7	59·56	38·24	21·32	897	60·34	40·52	19·82	896
8	59·15	38·22	20·93	919	60·37	40·65	19·72	957
9	59·73	37·89	21·84	634	60·42	40·70	19·72	961
10	59·62	37·75	21·87	646	60·48	40·79	19·69	885
11	59·72	37·84	21·88	660	60·52	40·62	19·90	685
12	59·65	38·16	21·49	771	60·45	40·56	19·89	776
13	59·73	38·04	21·69	796	60·47	40·66	19·81	729
14	59·69	38·27	21·42	878	60·26	40·63	19·63	755
15	59·60	38·27	21·33	888	60·41	40·61	19·80	746
16	59·56	37·89	21·67	650	60·41	40·64	19·77	718
17	59·56	38·02	21·54	779	60·14	40·72	19·42	959
18	59·67	38·44	21·23	902	60·28	40·51	19·77	687
19	59·73	38·96	20·77	1,052	60·22	40·59	19·63	883
20	59·70	39·46	20·24	953	60·21	40·66	19·55	962
21	59·65	39·90	19·75	1,148	60·27	40·54	19·73	741
22	59·75	39·90	19·85	888	60·32	40·52	19·80	714
23	59·83	39·30	20·53	676	60·05	40·66	19·39	947
24	59·74	39·27	20·47	1,108	60·26	40·48	19·78	720
25	59·54	39·32	20·22	962	60·24	40·57	19·67	693
26	59·73	39·33	20·40	926	60·15	40·69	19·46	945
27	59·83	39·34	20·49	904	60·13	40·73	19·40	754
28	59·73	39·33	20·40	922	60·09	40·95	19·14	974
29	59·68	39·31	20·37	868	60·13	40·98	19·15	947
30	59·72	39·06	20·66	674	60·08	40·91	19·17	757
31	59·71	39·02	20·69	831	59·93	40·98	18·95	990

	June				August			
Day.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.
1	59·72	39·22	20·50	919	59·92	40·78	19·14	720
2	59·64	39·21	20·43	909	59·85	40·78	19·07	989
3	59·57	39·20	20·37	898	59·88	40·87	19·01	932
4	59·65	39·19	20·46	890	59·82	40·72	19·10	758
5	59·85	39·26	20·59	903	59·81	40·70	19·11	753
6	59·50	38·94	20·56	677	59·81	40·70	19·11	753
7	59·53	38·86	20·67	841	59·75	40·68	19·07	843
8	59·34	39·14	20·20	954	59·75	40·68	19·07	976
9	59·59	39·19	20·40	916	59·79	40·69	19·10	801
10	59·67	39·22	20·45	924	59·77	40·44	19·33	737
11	59·55	39·27	20·28	897	59·82	40·32	19·50	742
12	59·60	39·26	20·34	892	59·73	40·28	19·45	735
13	59·47	39·01	20·46	670	59·72	40·23	18·49	738
14	59·90	38·90	21·00	669	59·62	40·23	19·39	735
15	59·73	39·00	20·73	680	59·62	40·23	19·39	705
16	59·45	39·05	20·40	695	59·43	40·06	19·37	716
17	59·85	39·03	20·82	693	59·62	40·08	19·54	736
18	59·69	39·26	20·43	910	59·55	40·10	19·45	748
19	59·75	39·32	20·43	847	59·55	40·08	19·47	740
20	59·92	39·04	20·88	651	59·62	40·06	19·56	743
21	60·04	39·14	20·90	692	59·42	39·54	19·88	719
22	59·80	39·24	20·56	723	59·17	38·74	20·73	671
23	60·14	39·46	20·68	829	59·52	38·30	21·22	704
24	59·94	39·46	20·48	880	59·23	38·00	21·23	700
25	60·12	39·38	20·74	687	59·14	37·84	21·30	685
26	60·05	39·35	20·70	682	59·40	37·28	22·12	673
27	60·20	39·26	20·94	647	59·55	37·08	22·47	662
28	60·32	39·34	20·98	795	59·39	36·94	22·45	638
29	60·21	39·66	20·55	895	59·27	36·64	22·63	631
30	60·30	40·02	20·28	910	59·43	36·59	22·84	642
31	...	...	...	...	59·38	36·54	22·84	649

Relation between gauge reading and datum:—
Zero of headrace and tailrace gauges = 1,000·00 W.P.S. datum.

MEAN DAILY GAUGE HEIGHT, IN FEET, AND MEAN DAILY DISCHARGE, IN FEET PER SEC., OF EAST BRANCH WINNIPEG RIVER AT KENORA POWER HOUSE, FOR SEPTEMBER, OCTOBER, NOVEMBER AND DECEMBER, 1915.

	SEPTEMBER				NOVEMBER			
Day	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.
1	59·28	36·53	22·75	639	58·68	36·54	22·14	1,453
2	59·27	36·58	22·69	646	58·68	36·49	22·19	1,472
3	59·35	36·59	22·76	636	58·78	36·51	22·27	1,460
4	59·28	36·54	22·74	663	58·64	36·52	22·12	1,501
5	59·37	36·38	22·99	615	58·98	36·53	22·45	1,466
6	59·27	36·31	22·96	618	58·74	36·58	22·16	1,502
7	59·27	36·41	22·86	631	58·68	35·66	23·02	802
8	59·32	36·51	22·81	673	58·74	36·49	22·25	1,140
9	59·23	36·54	22·69	705	58·79	36·60	22·19	1,060
10	59·11	36·59	22·52	729	59·18	35·84	23·34	982
11	59·10	36·55	22·55	717	58·76	36·62	22·14	1,419
12	59·12	36·33	22·79	636	59·10	35·92	23·18	927
13	58·98	36·76	22·22	882	58·80	36·56	22·24	1,547
14	58·96	36·86	22·10	930	58·81	35·81	23·00	1,094
15	59·21	36·92	22·29	923	58·80	36·56	22·24	1,555
16	59·17	36·98	22·19	932	58·84	36·61	22·23	1,551
17	59·08	36·94	22·14	949	58·97	36·59	22·38	1,522
18	58·88	36·94	21·94	945	58·93	36·60	22·33	1,513
19	59·13	36·31	22·82	649	58·61	36·58	22·03	1,488
20	58·46	36·85	21·61	1,198	58·79	36·62	22·17	1,536
21	58·95	36·88	22·07	970	58·67	35·92	22·75	1,147
22	59·07	36·89	22·18	1,143	58·87	36·60	22·27	1,482
23	58·93	36·91	22·02	914	58·83	36·59	22·24	1,516
24	58·79	36·85	21·94	1,139	58·81	36·57	22·24	1,507
25	58·91	36·92	21·99	967	58·67	36·60	22·07	1,458
26	58·74	36·31	22·43	666	58·80	36·63	22·17	1,510
27	58·95	36·76	22·19	1,161	58·78	36·66	22·12	1,493
28	59·02	36·89	22·13	1,191	58·90	35·71	23·19	842
29	58·98	36·92	22·06	1,205	58·77	36·50	22·27	1,281
30	59·00	36·96	22·04	1,016	58·80	36·60	22·20	1,511

	OCTOBER				DECEMBER			
Day	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.	Headrace Gauge.	Tailrace Gauge.	Head in feet.	Discharge. c. f. s.
1	58·98	36·69	22·29	1,143	58·80	36·66	22·14	1,533
2	59·11	36·57	22·54	967	58·80	36·64	22·16	1,540
3	58·93	35·71	23·22	659	58·77	36·65	22·12	1,552
4	58·58	36·40	22·18	1,129	58·78	36·59	22·19	1,498
5	59·03	36·44	22·59	1,375	58·85	35·74	23·11	826
6	58·83	36·54	22·29	1,397	58·78	36·46	22·32	1,235
7	58·48	36·56	21·92	1,460	58·83	36·58	22·25	1,266
8	58·62	36·51	22·11	1,437	58·87	35·76	23·11	759
9	59·15	36·53	22·62	1,424	58·84	35·74	23·10	1,072
10	59·00	35·59	23·41	744	58·80	36·61	22·19	1,535
11	58·85	36·41	22·44	1,205	58·84	36·66	22·18	1,543
12	59·01	36·51	22·50	1,419	58·89	35·83	23·06	1,042
13	58·90	36·52	22·38	1,431	58·84	36·63	22·21	1,537
14	58·92	36·48	22·44	1,401	58·81	36·70	22·11	1,576
15	58·98	36·47	22·51	1,411	58·82	36·66	22·16	1,564
16	58·90	36·46	22·44	1,419	58·84	36·69	22·15	1,483
17	58·95	35·67	23·28	730	58·84	36·69	22·15	1,560
18	58·91	36·40	22·51	1,130	58·85	36·65	22·20	1,576
19	59·08	35·74	23·34	661	58·92	35·92	23·00	898
20	58·88	35·69	23·19	1,017	58·86	36·58	22·28	1,058
21	58·82	36·44	22·38	1,240	58·87	36·66	22·21	1,504
22	58·80	36·46	22·34	1,424	58·85	36·66	22·19	1,529
23	58·75	36·46	22·29	1,413	58·82	36·66	22·16	1,542
24	58·89	36·39	22·50	1,391	58·82	35·96	22·86	849
25	59·07	36·49	22·58	1,422	58·94	35·73	23·21	767
26	58·64	36·54	22·10	1,159	58·94	35·54	23·40	741
27	59·03	36·47	22·56	1,418	58·89	36·53	22·36	1,345
28	58·68	36·49	22·19	1,138	58·84	36·66	22·18	1,530
29	58·78	36·46	22·32	1,391	58·83	36·61	22·22	1,552
30	58·80	36·46	22·34	1,417	58·92	36·68	22·24	1,509
31	58·91	35·75	23·16	1,006	58·87	36·63	22·24	1,502

Relation between gauge reading and datum:—
Zero of headrace and tailrace gauges = 1,000·00 W.P.S. datum.

METEOROLOGICAL STATION, KEEWATIN.

In the Spring of 1913 a meteorological station was established at Keewatin on the Lake of the Woods, and from the month of May of that year continuous records have been obtained at this station.

The equipment of the station consists of:—

(1) A galvanized iron evaporation tank supported on a raft on the surface of the lake, and provided with brass pointer and measuring cups.

(2) One Howard rain gauge.

(3) One thermometer for water temperatures.

(4) One recording thermometer.

(5) One recording barometer.

(6) Wing gauge of the Robertson type.

(7) One hygrometer.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR MAY, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	..	.			.		..	....	....		
2	....	....	....		.			Set tank	.....		
3	....	....	47	.	3·46	..		0·00	·015	.	.
4	....	....	47	.	3·54	.	.	0·01	·195		..
5	....	....	....	.	3·54	..		.....	. .		
6			....	.	3·77	...	.	Set tank	.	.	..
7		.	.	.	5·70	.		......			.
8		.	44		5·70 6·98			·14			.
9			50	....	3·48			·11			
10		.	50	.	2·62	.	.	·24	.	.	
11				..	5·82	..		.	.....		..
12			44	. .	5·82	..		·07	·15	.	S
13			32	.	6·32	..		·00	·16	.	S
14			37	...	4·15	.		·05	....		P
15			38		3·88	.		·00	·03		S
16	.	.	.		3·88	..		·01	·16	.	S
17		.	40		3·22	.		·00	·065		S
18	44		44	.	6·97	.		·06	·02	..	S
19	42	..	43		6·97	..	.	·00	·005	.	S
20	43	..	48		2·50	.		·07	...	.. .	P
21	46	..	50		5·48	.		·10	·03	.	S
22	47	..	59		5·48			·05	.. .	..	S
23	46	47	50·5		1·80 3·25			·005	·285		P S
24	48	50	51		4·41			·09	... ..	.	P
25	47	48	58	.	.			·16	......	... .	P
26	49	52	63	..	.			·05	....	.	P
27	50	51	75					·04	·02		P S
28	51	53	65	.				·03	·01	.	S
29	54	56	66					·00	·04		S
30	55	56	57					·02			P
31	51	53	60					·06	·10		S

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR JUNE, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity.	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1.	52	54	66	55·5	8·00	...	...	·04	...	...	P
2.	51	52	56	52	2·83	...	...	·09	·20	...	P
3.	50	51	56	49	4·93	...	...	·04	...	...	Q
4	52	53	60	51·5	6·45	...	...	·11	...	...	Q
5.	52	53	58	52	3·00	...	...	...	·34	...	S
6.	51	52	50	43	7·39	...	...	·07	...	...	Q
7	52	54	58	46·5	2·84	...	...	·13	...	...	P
8..	54	55	65	51	2·14	SE.	...	...	...	...	P
						NW.		·10			P
9.	56	57	70	59	3·49	SE.	29·81				P
						NW.		·10		48	P
10...	54	55	61	58	4·92	SW.	29·71			54	P
						SW.	29·47	·10		68	P
11..	55	57	68	61	6·07	SW.					P
						SW.	29·41	·10		53	P
12....	56	58	75	67	3·88	S					P
						NW.	29·26	·04		61	P
13..	60	61·5	69	70	3·81	SW.	29·24			77	S
						NE.	29·16	·02	·38	81	S
14	63	64	72	66	3·27	E.	29·06			74	P
						SE.	28·96	·03		81	S
15.....	66	68	80	68·5	5·59	SW.					Q
						W.	29·21	·08	·01	47	Q
16	61	61·5	68	61	8·76	N.	29·36			71	Q
						N.	29·46	·11		60	P
17 .	60	60·5	63	51·5	2·33		29·46			64	P
							29·46	·13		75	Q
18.	62·5	62·5	71·5	59	1·06	SE.	29·41			63	P
						SW.	29·40	·07		76	Q
19 ..	63	63·5	78·5	65	1·36		29·35			65	P
						SW.	29·41	·06		56	P
20	61·5	62	80	61·5	3·44	NE	29·32			44	P
						N.	29·31	·09		34	P
21 ..	65	64·5	72·5	60·5	1·31	NW.	29·40			34	P
						SW.	29·36	·13		81	P
22	68	69	90	63	1·90	SE.					P
						S	29·31	·05		37	P
23 ..	66	67·5	72·5	67·5	4·54	S.W.	29·01			53	P
						E.	28·99			90	P
24	65·5	66	81	72·5	4·45	E.	28·91			42·5	P
						S.	28·86	·13		63	P
25	66	67	75	70	5·93	SW.	28·76			63	S
						SW.	28·86	·08	·27	66	S
26	65·5	66	76	61	5·65	N.	29·11			42	Q
						N.	29·26	·18		·38	Q
27	65	64·5	58	53·5	5·85	NE.	29·10				S
						NE.	29·26	·03	·55		S
28	67	67	71	67·5	1·57	E.	29·15			85	S
						E.	29·16	·06	·28	78	P
29	70	70	94	69	4·58	SE.					P
						SE.	29·11	·02		39	P
30	68·5	69	73	64·5	8·26	SW.	28·90			62	S
						SW.	28·96	·16	·06	54	S

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR JULY, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1..	66·0	66·0	59·0	57·0	6·17	N.	29·20	·08	......	....	S
	69·0	69·0	73·0	......	6·13	N.	29·31	·05		58·0	S
2.	67·0	67·0	68·0	......	0·52	SW.	29·30	·06		55·0	S
	68·0	67·0	67·0	56·5	3·79	SE.	29·06	·07	...	76·0	Q
3.	67·0	67·0	75·0	......	5·09	SW.	28·99	·06	·01	48·0	Q
	66·0	66·0	60·0	57·5	2·72	S.E	29·16	·08	....	100·0	P
4..	66·0	65·0	58·0	......	2·72	N.	29·31	·06	..	89·0	Q
	66·0	66·0	59·0	56·5	11·14	SW.	29·22	·07	....		Q
5..	65·0	65·0	61·0	......	6·36	N.	29·06	·01	·73	94·0	Q
	66·0	66·0	52·0	53·0	7·07	N.	29·26	·01	·08	81·0	S
6..	......	......	......	......	3·07	SW.	......	......	....	29·0	P
	70·0	71·0	80·0	60·5	2·19	SW.	29·54	·08	·01		P
7...	69·0	68·0	78·0	......	1·50	W.	29·28	·07	.....	60·0	P
	67·0	68·0	66·0	61·0	3·14	SW.	29·16	·07	.....	80·0	P
8	66·9	66·0	76·0	.....	5·95	W.	29·01	·01	..	45·0	P
	65·0	65·0	62·5	65·0	23·00	W.	28·91	·17	·01	79·0	S
9.	65·0	63·8	56·0	......	5·23	NW.	29·26	·10	......	65·0	P
	65·5	66·0	63·0	58·0	5·72	NW.	29·37	·14	......	56·0	P
10.	65·8	65·0	62·5	......	1·71	S.	29·31		...	65·0	P
	66·0	66·5	68·5	56·5	5·68	E.	29·15	·06		57·0	S
11.	65·6	64·8	63·0	......	8·56	S.	28·86	·05	·99	90·0	S
	65·5	64·5	60·0	54·7	8·42	S.	28·76	·02	·22	89·0	S
12..	65·0	63·6	58·5	......	8·41	SE.	28·65	·05	·62	89·0	S
	64·6	63·5	56·0	49·0	10·31	SE.	28·80	·04	·23	88·0	S
13.	65·6	66·0	63·0	......	4·51	NW.	29·17	·01	...	58·0	Q
	68·0	68·5	67·0	58·5	3·19	NW.	29·21	·08	·02	46·0	P
14	64·5	63·5	58·0	......	3·19	SE.	29·31	·05	......	77·0	P
	68·5	69·5	73·0	58·5	2·91	SE.	29·35	·05	......	68·0	P
15.	66·0	66·0	63·0	......	4·30	S.	29·43	·09	......	72·0	Q
	67·0	67·5	69·5	63·0	3·74	S.	29·44	·03	.....	79·0	Q
16..	66·0	66·0	65·0	......	2·75	SE.	29·45	·03	·18	80·0	S
	69·0	70·0	72·0	66·5	1·31	S.	29·40	·03	·01	86·0	Q
17.	66·0	65·5	64·8	......	2·45	S.	29·45	·02	....	75·0	Q
	67·9	69·0	75·0	64·5	5·89	NW.	29·42	·08	..	44·0	Q
18	65·8	65·6	69·7	......	1·30	SW.	29·40	·02	.	75·0	P
	66·0	66·5	65·5	66·0	9·48	NW.	29·37	·08	...	62·0	P
19	66·0	65·0	62·0	......	6·10	NW.	29·39	·03	...	79·0	P
	66·5	66·0	58·0	63·0	6·99	N.	29·43	·05	·09	61·0	Q
20	......	......	......	......	1·99	N.	......	·02	...	.	Q
	68·0	68·5	68·0	62·0	2·96	SW.	29·52	·00	·01	65·5	Q
21	67·5	67·0	64·5	......	4·97	NW.	29·22	·13	....	82·0	S
	67·4	68·5	74·5	67·0	7·03	NW.	29·20	·05	·43	54·5	Q
22	67·0	66·2	65·5	......	4·98	NW.	29·15	·04	.	64·0	Q
	67·5	67·5	60·5	60·2	10·80	NE.	29·15	·06	·14	78·5	Q
23.	66·0	65·0	57·0	.	5·18	N.	29·30	·05	....	74·0	P
	66·0	66·0	56·5	59·5	1·33	N.	29·36	·10	....	66·0	P
24	66·5	65·5	59·0	......	6·77	W.	29·38	·03	.	75·0	P
	67·0	67·0	67·0	59·0	5·00	N.	29·30	·08		50·0	P
25	66·5	66·0	66·0	.....	3·52	SW.	29·20	·04	..	66·0	P
	68·0	69·2	77·0	67·0	5·23	SW.	29·15	·08		52·0	P
26	66·0	65·0	64·5	..	3·73	S.	29·00	·04		82·0	P
	66·5	67·0	71·0	67·0	3·63	S.W.	29·00	·06		73·0	S
27	67·0	67·0	62·0	..	8·71	NW.	29·20	·06	.	57·0	S
	67·0	66·5	63·0	61·0	10·58	NW.	29·30	·06	·06	62·5	Q
28	66·0	65·0	62·5	..	2·44	W.	29·36	·04		72·0	Q
	67·0	67·0	68·5	59·0	5·99	SW.	29·33	·01	.	59·0	Q
29	66·0	66·0	69·0		3·30	S.	29·24	·06		72·0	Q
	70·0	71·0	79·0	75·0	3·75	SW.	29·20	·05		57·0	P
30	67·0	68·0	72·0	.....	3·66	SE.	29·10	·01		82·0	P
	70·5	71·5	78·0	74·5	5·35	W.	29·46	·00		57·0	P
31	65·5	65·5	62·0	.	8·93	W.	29·18	·07		60·0	P
	67·0	67·0	72·0	63·0	11·11	W.	29·25	·12		46·0	P

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR AUGUST, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	69·0	69·5	72·0	......	6·08	W.	29·38	·08	....	61·0	P
	68·0	69·2	78·0	68·0	3·13	NW.	29·37	·07	....	40·0	P
2	67·0	67·0	72·0	....	6·46	W.	29·35	·08	....	57·0	P
	68·0	70·5	81·0	71·0	7·56	NW.	29·37	·05	....	39·0	Q
3	68·5	69·0	68·0	......	7·44	NW.	29·45	·08	....	47·0	P
	70·5	72·0	76·0	66·0	6·88	W.	29·45	·06	......	37·0	P
4	67·5	67·0	63·0	......	0·89	W.	29·34	·08	......	65·0	P
	68·5	68·5	70·0	61·0	2·56	W.	29·25	·08	......	60·0	Q
5	67·5	67·0	65·0	....	2·08	N.	29·27	·05	....	70·0	Q
	68·0	69·0	70·0	65·5	4·08	N.	29·40	·10	....	48·0	Q
6	67·0	66·0	59·0	......	1·20	N.	29·38	·03	..	78·0	S
	70·0	70·0	69·0	62·0	2·06	S.	29·35	·09	....	55·0	Q
7	67·5	66·0	61·0	...	2·22	S.	29·10	·09	...	68·0	S
	66·0	67·0	65·0	63·5	6·88	S.	28·90	·03	·69	90·0	S
8	66·0	65·0	58·0	......	4·34	W.	28·87	·01	·51	77·0	S
	67·0	67·0	64·5	60·0	7·89	W.	28·97	·02	·21	82·0	S
9	67·0	66·0	64·0	......	1·92	N.	29·15	·08	..	79·0	S
	67·0	65·5	54·0	52·5	5·00	N.	29·45	·08	·01	74·0	S
10	66·0	65·5	59·0	......	7·22	SE.	29·54	·08	....	53·0	S
	65·0	64·8	59·0	52·0	7·25	SE.	29·45	·10	..	73·0	S
11	65·0	64·0	54·5	....	7·05	SE.	29·35	·01	·23	94·0	S
	65·8	66·8	64·2	56·0	1·33	S.	29·37	·01	·01	81·5	S
12	65·6	65·8	68·0	....	1·56	SW.	29·33	·01	......	88·0	S
	68·8	71·4	67·0	69·0	0·07	S.	29·31	·04	....	67·0	P
13	67·2	68·0	77·0	....	0·64	S.	29·26	·02	..	88·0	P
	71·0	72·6	75·0	73·0	4·18	S.	29·30	·02	....	82·0	P
14	70·0	70·0	74·0	......	1·67	S.	29·06	·02	..	86·0	Q
	74·0	76·0	81·0	74·0	3·93	S.	29·30	·05		86·0	Q
15	70·0	69·0	69·0	..	6·00	S.	29·20	·00		61·0	Q
	74·0	70·0	78·0	67·5	2·98	W.	29·50	·02	1·78	86·0	S
16	68·0	69·0	64·0	....	2·86	SW.	29·25	·04	.	75·0	S
	71·0	71·0	64·0	64·5	2·32	W.	29·35	·02		79·0	S
17	71·0	71·0	64·0	..	....		29·40	·02		61·0	P
	73·0	72·0	64·0	54·0	3·30	NW.	29·52	·16		55·0	P
18	68·0	67·0	66·0	....	4·14	E.	29·51	·09		71·0	P
	70·8	70·0	71·8	63·0	3·85	S.	29·55	·04		65·0	P
19	68·0	68·0	66·0	..	7·37	SE.	29·50	·075		76·0	S
	69·2	70·0	68·2	68·0	4·62	SW.	29·46	·01	·035	85·0	S
20	69·0	69·0	71·0	...	2·48	N.	29·45	·05		86·0	S
	74·3	73·0	68·5	72·0	3·46	W.	29·36	·05		62·0	S
21	69·0	68·0	63·0		7·22	W.	29·25	·05	·20	74·0	P
	66·0	67·0	61·0	61·5	11·93	N.	29·40	·12	·11	79·0	Q
22	67·0	66·0	60·0		5·34	NE.	29·49	·04		89·0	P
	71·0	70·0	68·0	61·0	1·57	NW.	29·40	·05		60·0	P
23	68·0	68·0	66·8	..	6·08	W.	29·35	·07		71·0	P
	68·0	68·0	66·5	59·0	6·42	N.	29·40	·09		55·0	P
24	69·0	69·0	65·0	.	3·36	SW.	29·38	·09		62·0	Q
	68·0	68·0	65·0	55·0	6·00	NW.	29·20	·04		75·0	S
25	68·0	66·0	66·0	......	6·00	NW.	29·05	·075	·015	76·0	P
	69·0	71·0	72·5	58·0	17·17	NW.	29·21	·08		46·0	P
26	66·0	66·0	62·0	....	9·48	N.	29·25	·09		69·0	S
	67·0	67·0	60·0	60·5	6·30	N.	29·36	·06		94·0	P
27	67·0	66·0	62·0	..	1·94	SE.	29·35	·04		81·0	Q
	67·0	67·0	63·0	58·5	5·88	SE.	29·30	·03	·08	90·0	S
28	66·0	65·0	58·0		4·73	W.	29·36	·07	·30	83·0	S
	67·0	67·0	59·0	58·0	15·60	NW.	29·18	·08	·09	89·0	S
29	66·0	64·0	58·0		8·98	NW.	29·22	·04		88·0	S
	66·0	66·0	60·0	60·5	6·72	NW.	29·17	·07		81·0	P
30	65·0	65·0	63·0		2·46	SW.	29·10	·02		79·0	Q
	68·0	70·0	72·0	61·5	2·49	SW.	29·13	·04		65·0	P
31					33·00	SE.					P
	67·0	68·0	65·0	54·5	3·30	SE.	29·26	·08		57·0	P

Average time of observation. 7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR SEPTEMBER, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	67·0	68·0	71·0	...	6·6	SE.	29·00	·13	...	69	P
	67·0	68·0	70·0	68.5	5·14	S.	29·05	·06	·03	81	P
2	64·0	63·0	60·0	...	7·16	NW.	29·39	·04		78	P
	66·5	68·0	60·0	60·0	6·67	NW.	29·50	·06		71	P
3	66·0	64·0	58·0	...	2·48	SE.	29·57	·05	...	72	S
	66·0	66·0	62·0	56.5	6·88	SE.	29·46	·05	...	79	Q
4	66·0	64·0	58·0	...	7·91	SE.	29·34	·13	...	80	S
	66·0	66·0	64·0	59.5	6·74	SE.	29·35	·04		90	P
5	66·0	65·0	64·5	...	4·36	SE.	29·34	·04	...	87	Q
	68·0	70·5	74·0	67·0	3·28	SE.	29·29	·02	...	80	P
6	66·0	67·0	69·0	...	2·05	SE.	29·25	·01	...	90	Q
	72·0	76·0	79·0	74.5	1·76	SE.	29·25	10	·02	88	P
7	66·0	64·0	58·0	...	5·83	NW.	29·41	·01		89	P
	66·0	66·0	60·0	62.5	10·76	NW.	29·60	·07	·23	68	P
8	66·0	64·0	60·0	...	2·52	S.	29·70	·07	...	68	P
	66·0	65·0	61·0	54.5	2·76	S.	29·60	·08		68	P
9	65·0	64·0	58·0	...	6·86	SE.	29·45	·08		67	S
	66·0	68·0	69·0	62·0	9·48	SE.	29·24	·10		68	Q
10	65·0	64·0	61·0	...	5·22	NW.	29·36	·13		89	S
	66·0	68·0	66·0	63·0	2·45	NW.	29·40	·07	·47	66	P
11	63·0	62·0	50·0	...	4·02	NW.	29·45	·07	...	81	P
	64·0	63·0	56·0	55·0	1·34	NW.	29·50	·15		55	P
12	64·0	60·0	50·0	...	7·24	N.	29·51	·09	...	77	Q
	63·0	65·0	59·0	50·0	2·98	N.	29·52	·09	...	53	P
13	62·0	58·0	41·0	...	3·37	E.	29·46	·06	...	92	P
	64·0	64·0	55·0	61·5	4·98	E.	29·40	·11	...	60	P
14	...	...	...	...	7·38	SE.	...	...	...	...	P
	63·0	61·0	56·0	59·0	7·51	S.	29·17	·10	...	77	P
15	64·0	63·0	58·0	...	5·21	NW.	29·34	·155	·475	83	P
	64·0	64·0	58·0	55.5	3·31	SW.	29·45	·07	...	83	P
16	63·0	61·0	54·0	...	0·39	SW.	29·47	·025	...	94	Q
	65·0	63·0	60·0	57·0	0·84	SW.	29·50	·06	·005	68	P
17	63·0	61·0	54·0	...	0·63	SW.	29·45	·04	...	88	P
	61·0	64·0	62·0	61·0	2·17	SW.	29·36	·05	...	79	P
18	63·0	63·0	62·0	...	0·51	SW.	29·20	·04	...	69	P
	64·0	64·0	66·0	61·0	7·06	S.	29·00	·08	...	71	S
19	64·0	61·0	60·0	...	7·39	W.	29·32	·01	...	92	P
	63·0	60·0	60·0	47.5	7·56	W.	28·80	·13	·06	81	S
20	61·0	57·0	40·0	...	14·3	NW	29·12	·15	...	84	S
	60·0	57·0	38·0	41.5	21·96	N.W	29·21	·12	·015	67	Q
21	...	...	...	...	27·5	N.	29·26	...	...	62	Q
	60·0	59·0	42·0	39·5	13·5	NE.	...	·12	...		Q
22	59·0	57·0	38·0	...	1·98	NE.	29·25	·10	...	91	P
	59·0	57·0	43·0	35·0	3·29	S.W	29·25	·08	...	49	P
23	59·0	54·0	43·0	...	4·52	SE.	29·35	·08	...	78	P
	59·0	54·0	43·0	38·0	3·41	SE.	29·35	·08	...	78	P
24	58·0	54·0	43·0	...	3·31	NE.	29·30	·07	·04	85	S
	58·0	54·0	44·5	41·5	2·34	NE.	29·30	·03	...	84	S
25	57·0	53·0	41·0	...	0·62	SW.	29·25	·04	...	85	S
	57·0	56·0	50·0	43·0	4·37	W.	29·20	·04	...	62	S
26	56·0	52·0	41·0	...	2·99	NW.	29·15	·06	...	84	Q
	58·0	60·0	61·0	49 0	21·37	NW.	29·32	·08	...	50	P
27	57·0	55·0	52·0	...	4·06	SW.	29·25	·05	...	75	P
	58·0	56·0	72·0	57·0	9·13	SW.	29·22	·09	...	42	P
28	58·0	58·0	59·0	...	4·48	W.	29·10	·05	...	68	P
	...		...	59.5	2·02	NE.	...	...	...	...	P
29	56·0	54·0	48·0	...	...	SE.	29·18	·08	...	87	P
	59·0	61·0	62·0	...	3·18	SE.	29·25	·04	...	60	P
30	56·0	58·0	54·0			SE.	29·19	·03	...	88	P
	60·0	63·0	71·0	...	2·87	SW.	29·20	·01		47	P

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR OCTOBER, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity.	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	57	57	56	......	....	N.W	....	·02	..		R
	57	57	62	55	10·3	....	28·85	·065	...	85	R
2	57	56	50	...	5·5	SW.	......	·06	....	....	P
	58	59	62	53	4·4	SW.	28·80	·05	·015	63	R
3	57	56	50	..	4·1	SW.	....	....	....	...	P
	57	57	56	55	2·9	NW.	28·62	·07	.	80	P
4	56	55	46	......	2·5	NE.	.....	·05	...	..	R
	57	54	49	45	2·8	NE.	28·87	·05	....	79	R
5	55	54	42	......	6·7	NE.	......	·03	·64	....	S
	55	54	42	40	6·6	NE.	28·77	·04	·32	81	S
6	54	53	40	......	4·4	NE.	.....	·04	·01	...	S
	54	53	43	38	9·4	NE.	28·73	·03	....	80	S
7	54	52	44	......	2·7	SW.	.....	·03	....	..	P
	54	52	54	43	11·8	SW.	28·80	......	·73	89	S
8	55	57	53	....	3·8	NE.	......	·03	....	...	Q
	55	56	55	42	2·0	NE.	28·90	.....	..	70	R
9	55	56	55	....	2·7	NE.	.....	·02	...	..	S
	56	55	59	47	3·5	NE.	28·85	·02	·08	85	R
10	55	56	59	...	1·4	S.	....	·02	...		S
	55	54	45	46	4·1	SE.	28·41	·03	98	91	S
11	54	53	48	...	1·7	SW.	.....	·06	...		S
	54	52	50	40	1·0	NW.	28·55	·08	..		S
12	52	50	48	.....	1·8	SW.	28·85	·11	....		R
	52	53	48	40	4·6	SW.	28·95	·02	·02	90	Q
13	52	51	52	......	5·9	SE.	28·80	·03	..		P
	54	57	62	52	11·0	SE.	28·73	·01	...	83	Q
14	53	52	55	.....	6·4	SW.	28·65	·11			R
	52	52	46	49	7·9	NW	28·82	·06		74	S
15	52	50	39	....	0·4	NW.	29·15	·08			Q
	52	52	45	37	4·6	....	29·19	·05		62	P
16	52	49	39	....	2·8	NE.	29·25	.			P
	51	51	42	37	2·5	NE.	29·25	·07		61	P
17	50	48	44	..	0·8	S.	29·17	·04			P
	50	50	44	42	8·1	SE.	29·06	·08		74	S
18	.50	49	40	....	5·8	NW.	28·94	·05			R
	50	50	38	38	5·6	NW.	28·90	·06		72	Q
19	49	47	27	.	5·6	N.	28·96	·04			S
	48	45	28	30	8·6	N.	28·99	·05		70	R
20	48	44	26		5·6	N.	28·70	·04			R
	47	43	20	30	1·6	N.	28·72	·06		73	S
21	46	43	20	.	2·6	NW.	28·70	·03			S
	46	44	22	19	3·3	N.	28·67	·03		71	R
22	46	44	30		3·0	SE.	28·67	·06			S
	46	45	35	27	3·9	S.	28·67	·01		100	S
23	46	45	36		3·1	S.	28·50	·02			S
	46	45	38	33	5·9	S.	28·40	·02	·16	95	S
24	46	45	38		3·7	NW.	28·73	·07			S
	46	46	41	37	5·5	NW.	28·80	·03	·02	81	Q
25	46	45	37	..	3·9	NW.	28·84	·04	·03		S
	46	45	37	40	4·1	NW.	28·92	·01	·06	91	S
26	45	43	32		4·9	NW	29·00	·04			Q
	45	43	32	33	4·9		28·95	·01		100	S
27	44	43	34	......	5·5	NW.	28·72	·02			S
	44	43	35	30	4·2	NW.	28·70	·01		77	S
28	43	40	34		5·4	NW.	29·08				P
	43	41	21	20	7·2	NW.	29·13		·11	88	R
29	43	40	17		2·2	NE.	29·10				S
	43	40	21	19		..	29·13			97	S
30	42	40	21		...	SW.	29·10				R
	42	40	27	24	1·7	SW.	29·16			87	S
31	41	40	26	.	1·6	SW	29·20				R
	41	42	37	31	10·2	SW.	29·16			65	Q

Average time of observation. 7.15 a.m. and 6.30 p.m

P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR NOVEMBER, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity.	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	41	39	33	.....	3·6	SW.	28·97	·03	......		Q
	41	41	11	37	6·7	SW.	29·27	·05	......	74	Q
2..	41	43	38	.....	1·5	S.	28·79	·02	......	....	Q
	42	44	43	41	18·3	Calm	29·09	·05	......	76	S
3...	41	40	34	.....	2·2	NW.	28·96	....	......	....	R
	41	39	28	30	7·8	NW.	29·26	·06	......	79	R
4...	41	40	37	......	4·0	SW.	29·02	·05	......	......	P
	41	42	49	28	8·7	SW.	29·32	·09	......	67	P
5...	41	41	42	......	2·6	SW.	28·70	·03	......	..	Q
	41	42	44	44	3·5	SW.	29·00	·04	......	63	Q
6........	41	40	41	......	2·7	SE.	28·49	·03	......	..	S
	41	44	45	41	1·1	SE.	28·79	·02	.....	88	S
7.....	41	40	33	......	2·9	NW.	28·73	·02	....	..	S
	41	40	20	41	12·9	NW.	29·03	Ice	·75	95	Q
8..	..	..	20	......	1·7	NW.	29·03	....	...	..	..
	....	.....	29	26	5·6	NW.	29·33	....	...	87	.....
9.	....	.....	22	......	1·7	NW.	29·10	....	...	...	.....
	..	..	14	27	6·2	NW.	29·40	....	...	72	....
10..	...	...	10	......	2·4	NW.	29·08	....	..	..	R
			18	11	2·5	NW.	29·38	....	..		R
11..			26	......	2·5	S.	28·70	......			R
			33	24	5·0	S.	29·00	......	·05	84	R
12.		..	30	......	4·3	SW.	28·66	....	......	..	R
		..	35	33	5·0	S.	28·96	....	...	95	R
13.		..	25	......	5·2	W.	28·85	....	...	.	S
			24	27	9·1	NW.	29·15	.....	...	87	S
14.			14	......	5·5	S.	29·13	......			P
			25	21	3·0	SW.	29·43	......		96	P
15.			32	......	2·6	W.	28·95	......		.	S
			35	28	9·2	W.	29·25	......		100	S
16..			36	......	3·9	SW.	28·64	......		.	R
			...	35	6·1	S.	28·94	......		91	R
17..			41	......	2·5	S.	28·60	......			P
			46	40	3·8	SW.	28·90	......		80	P
18..			25	......	6·5	NW.	28·85	......			R
			28	30	6·1	W.	29·15	......		88	Q
19..			36	......	2·7	SW.	28·55	......			S
			28	29	10·1	W.	28·85	...		85	R
20..			35	......	3·0	SW.	28·58	....		......	S
			39	34	7·3	SW.	28·88	.....		79	S
21.			38	......	1·3	Calm	28·48	·03			S
			33	35	7·2	NW.	28·78	·01	·02	95	S
22.			27	......	11·4	NW.	28·82	......			S
			28	27	13·5	NW.	29·12	......		89	R
23			30	.....	1·2	NW.	28·92	......			Q
			35	32	3·3	W	29·22	....	·05	69	P
24			34	.....	9·4	SE.	28·92	..			Q
			35	32	3·7	W.	29·22	.		72	S
25			30	..	2·8	NW.	28·82	.		.	S
			30	24	7·5	NW.	29·12	.		73	Q
26			24	.....	3·4	NW.	29·05	.			R
			29	30	5·8	SE.	29·35	.		76	Q
27			32		5·9	SE.	29·02	..			S
			37	35	4·2	SE.	29·32	.		86	R
28			36	.	2·3	SE.	29·00				S
			39	38	2·6	SW.	29·30			96	S
29			39		1·3	SW.	28·94				S
			36	35	4·9	SW.	29·24		·46	100	S
30			33	..	4·2	NW.	29·03			.	S
			32	33	1·4	SE.	29·33		·02	95	S

Average time of observation:—7.45 a.m. and 5.00 p.m.
R=Clear, no clouds.
Q=Small fleecy clouds.
R=Cumuli.
S=Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR DECEMBER, 1913.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1			32		2·2	SE.					S
			32	32	1·3	NW.	29·10			95	S
2			32		1·6	NW.					S
			32	33	2·7	W.	29·28			90	S
3			29		3·9	SW.					S
			35	31	3·9	SW.	29·27			95	S
4			32		7·4	SW.					P
			41	37	5·0	SW.	29·09			86	P
5			28		3·1	NW.					P
			35	34	1·5	NW.	28·95			85	P
6			28		4·5	NW.					Q
			20	24	17·0	NW.	28·96			68	Q
7						NW.					P
			12	12	5·3	NW.	29 11				P
8			22		4·1	SW.					S
			27	25	7·1	SW.	28·95			94	P
9			29		2·9	SW.					P
			32	29	10·1	NW.	28·81			89	P
10			23		6 0	NW.					Q
			31	27	2·4	S	28·92			88	P
11			27		2·8	SW.					P
			34	31	2·6	W.	28·75			89	P
12			22		2·5	SE.					Q
			29	26	1·0	Calm	28·83			88	P
13			22		0·7	SW.					P
				26	4·5		28·88			86	P
14											
				19			29·05				
15			27			S					S
			28	27	4·2	SE.	28·82			88	P
16			25		2·1	SW.					Q
			35	30	10·0	SW.	28·71			78	Q
17			27		10·2	N.					S
			25	25	7·4	N.	28·89			75	P
18			14		0·9	N.					P
			25	19	4·7	NE.	28·90				P
19			12		3·3	N.					R
			12	13	5·8	N.W.	28·81				R
20			0		6·4	NW.					Q
			12	8			28·73				P
21			−1		6·3	NW.					P
			5	5	2·5	NW.	28·82				P
22			9		1·7	SE.					S
			17	12	2·2	SE.	28·86				P
23			18		3·2	SE.					P
			20	16	1·6	SE.	28·78				P
24			10		6·0	NW.					R
			3	5			28·92				P
25			−9		3·0	SE.					P
				−2			29·01				P
26			13		3·1	SE.					R
			11	10	2·2	E.	28·90				S
27			10		1·5	NE.					S
			13	9	1·4	NW.	28·97				P
28			10		1·4	NW.					S
			19	10	7·2	S	28·85				P
29			16		10·0	NW.					S
			17	18	1·4	SW.	28·82				P
30			22		4·0	NW.					S
			17	20	2·9	N	28·87				P
31			9		3·1	S					S
			21	16	5·1	S	28·75				S

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR JANUARY, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour.		Inches	Inches	Inches	%	
1					6·3	SW.					S
	32		25	24	2·8	S.					S
2					1·2	N.					S
	32		23	21	2·7	N.					S
3					3·3	N.					S
	32		13	14	1·0	N.					S
4					2·0	SE.					P
	32		8	9	3·2	SE.					P
5					1·7	S					S
	32		18		14·1	SW.					S
6					8·2	W.					S
	32		27		6·1	W.					S
7					2·3	SE.					S
	32		30		4·1	NW.					S
8					2·6	N.					S
	32		23		3·1	N.			·42		S
9					4·0	N.					R
	32		7		3·7	N.			·27		S
10					1·4	SW.					R
	32		3		1·8	SW.					S
11					....	W.					P
	32		−8		9·7	W.					P
12					....	SE.					P
	32		−13		1·1	SE.					P
13					3·9	SE.					P
	32		9		7·3	SE.					Q
14					5·5	S					P
	32		19		8·0	NW.					S
15					6·6	E.					P
	32		18		4·0	E.					P
16					4·1	NW.					R
	32		17		4·5	NW.			·18		P
17					1·6	S					P
	32		18	15	3·9	E.					Q
18					....	SE.					S
	32		30	22	5·0	....					S
19					1·9	N.					S
	32		30	26	5·2	NE.					S
20					6·0	NW.					P
	32		4	5	4·8	W.					P
21					3·7	S					P
	32		−8	−7	5·6	SE.					P
22					2·0	S					P
	32		−7	−4	3·3	SE.					R
23					3·5	W.					P
	32		+4	−2	9·2	W.			·105		P
24					5·3	SW.					P
	32		−17	−16	3·8	S.					P
25					2·0	SE.					P
	32		−9	−10	2·3	S					P
26					2·3	E.					S
	32		+2	−3	6·2	N.					S
27					3·2	N.					P
	32		−2	−3	1·1	E.			·101		Q
28					3·2	E.					R
	32		20	+5	8·8	SE.					S
29					5·0	W.					Q
	32		−9	−5	20·0	W.					P
30					5·9	SE.					P
	32		−9	+2	2·4	E					P
31					7·2	W.					Q
	32		+2	−6	14·7	NW.			·26		P

Average time of observation:—7.45 a.m. and 5.00 p.m.
Precipitation measurement on the 8th includes snowfall of season to date.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR FEBRUARY, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1			−10								P
				5			28·75				P
2			10		4·4	NE.					S
			13	10	6·6	N.	28·75		·11		S
3			− 1		4·3	NW.					P
			4	− 1	2·5	N.	28·95				Q
4			− 5		1·6	N.					S
			− 2	− 4	1·7	N.	29·05				R
5			−29		0·8	W.					P
			−10	−20	7·0	W.	29·10				Q
6			−32		1·5	SW.					P
			− 6	−20	1·0	S	29·00				P
7			−34		0·9	S					P
			− 9	−20	0·5	S	28·80				Q
8			−20		5·4	SE.					R
			−10	−15	5·5	W.	28·70				R
9			−31		6·3	W.					P
			−16	−22	7·0	W.	28·75				P
10			−36		1·9	N.					P
			−16	−23	1·3	NW.	29·15				P
11			−40		3·5	W.					P
			−14	−20	0·9	S	29·40				P
12			−36		0·1	S					P
			6	−15	3·3	SE.	29·35				P
13			− 3		5·0	S					Q
			2	0	8·2	W.	29·00				Q
14			−17		6·7	W.					P
			4	− 5	2·7	W.	29·10				P
15											
			1	− 8	3·5	S.	28·75				
16			−18		6·4	E.					P
			4	− 6	0·7	E.	28.80		·09		S
17			−22		1·5	NW.					P
			8	− 2	1·3	SE.	28·85				Q
18			− 2		4·0	W.					Q
			1	− 4	14·7	NW.	28·85				P
19			−26		5·2	SW.					P
			− 3	−12	1·7	E.	29·00				P
20			−20		1·6	S					P
			+11	0			28·85				S
21			− 6		7·4	W.					P
			− 9	−10	9·0	N.	28·75				P
22			−26		3·9	NW.					P
			− 4	−20	2·7	W.	28·20				P
23			−22		1·8	S					P
			8	− 6	3·0	SE.	28·25				Q
24			8		5·0	SW.					S
			18	11	6·6	S	28·95				Q
25			20		3·1	SE.					Q
			31	20	3·0	SE.	28·75				P
26			22		3·4	S					P
			36	24	2·9	S.	28·90				P
27			34		5·1	S					P
			40	32	14·2	S	28·45				Q
28			− 1		14·0	W.					S
			− 1	2			28·70		·22		P

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR MARCH, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1			−20		11·4	S					P
			8	4			28·72				P
2			12		20·1	SE.					R
			20	21	6·9	SE.	28·31				Q
3			22		3·9	W.					Q
			33	24	9·2	W.	28·42				P
4			22		3·4	SE.					R
			35	21	5·9	E.	28·04		·09		Q
5			30		4·0	NE.					R
			34	30	2·2	NE.	28·21				S
6			27		0·9	N.					Q
			32	28	4·5	NE.	28·51		·26		
7			14		2·3	N.					P
			30	20	1·8	NE.	28·70				
8			0								
			26	12			29·05				
9			0		1·3	NE.					
			20	10	2·2	NE.	28·92				
10			6		2·8	NE.					
			25	15	2·0	NE.	29·27				
11			− 4		4·8	SE.					P
			25	12	6·4	SW.	28·65				P
12			13		4·7	W.					P
			33	24	5·7	NW.	28·52				Q
13			26		3·5	S.					P
			42	32	3·7	S.	28·14				Q
14			20		4·1	NW.					P
			40	31	2·8	S.	28·28				Q
15			38								
			40	36	8·5	W.	27·82		·01		Q
16			13		16·3	NW.					
			20	16	18·8	NW.	28·26				
17			8		4·2	NW.					P
			22	10	19·3	NW.	28·63				P
18			2		3·4	N.					P
			18	7	3·6	N.	28·80				P
19			− 1		1·7	E.					P
			18	4	1·7	SE.	28·82				Q
20			9		1·7	SE.					Q
			27	12	1·4	NW.	28·70			65	R
21			0		5·1	NW.					P
			19	7	0·9	SW.	28·89				
22			16		0·1	N.					
			20	17	7·2	NW.	28·65				
23			12		9·0	W.					P
			32	22	11·3	SW.	28·26			79	P
24			24		2·8	W.				87	Q
			26	23	4·2	N.	28·28			64	Q
25			8		6·3	N.					Q
			20	13	6·4	N.	28·15				Q
26			12		2·6	S.					R
			17	14	1·6	N.	28·38				R
27			12		3·3	NE.					P
			27	14	2·7	SE.	28·68			76	Q
28			29		4·3	S.				89	Q
			35	30	2·8	N.	28·48			91	Q
29			30								
			37	32	2·4	SE.	29·15				
30			28		3·7	S.				77	P
			47	32	2·4	S.	28·76			73	P
31			32		3·3	S.				79	Q
			40	33	2·4	N.	28·34			76	R

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR APRIL, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	......	......	36	......	1·1	N.	......	......	......	82	R
	34	......	39	34	1·9	NW.	28·64	......	·23	84	R
2	......	......	28	......	5·5	N.	......	......	......	77	R
	34	......	26	26	6·9	N.	28·70	......	·08	88	R
3	......	......	20	......	5·9	NW.	......	......	......	......	Q
	34	......	29	22	7·8	W.	28·85	......	......	89	Q
4	......	......	20	......	6·2	NW.	......	......	......	......	Q
	34	......	29	22	11·1	NW.	28·80	......	......	35	Q
5	......	......	32	......	5·0	SW.	......	......	......	74	Q
	34	......	32	24	5·0	S.	28·65	......	......	79	Q
6	......	......	32	......	3·7	W.	......	......	......	90	R
	34	......	28	26	1·2	N.	28·57	......	......	77	R
7	......	......	10	......	4·9	N.	......	......	......	......	Q
	34	......	26	14	6·8	NW.	28·95	......	·23	75	Q
8	......	......	20	......	4·6	N.	......	......	......	......	Q
	34	......	34	22	4·3	NW.	28·90	......	......	81	P
9	......	......	26	......	4·2	S.	......	......	......	88	P
	35	......	41	24	8·4	S.	28·40	......	......	84	Q
10	......	......	34	......	5·2	NW.	......	......	......	90	R
	34	......	27	27	1·3	......	27·97	......	......	65	R
11	......	......	20	......	8·1	S.	......	......	......	......	Q
	32	......	49	26	1·1	W.	28·27	......	......	77	Q
12	......	......	15	......	3·2	NW.	......	......	......	......	......
	33	......	......	20	2·2	......	28·70	......	......	......	......
13	......	......	29	......	2·8	SE.	......	......	......	89	Q
	33	......	50	40	2·7	S .	28·67	......	......	71	Q
14	......	......	35	......	1·8	N.	......	......	......	82	P
	35	......	49	39	2·0	N.	28·58	......	......	67	......
15	......	......	43	......	4·5	W.	......	......	......	78	P
	35	......	57	44	1·4	NW.	28·47	......	......	77	P
16	......	......	42	......	1·6	W.	......	......	......	85	Q
	36	......	......	43	3·6	E.	28·62	......	......	......	......
17	......	......	47	......	2·6	N.	......	......	......	89	Q
	36	......	49	45	2·3	N.	28·60	......	·05	80	R
18	......	......	37	......	5·6	NW.	......	......	......	91	Q
	36	......	30	33	9·1	N.	28·47	......	·29	......	Q
19	......	......	......	......	12·3	NE.	......	......	......	......	Q
	......	......	32	24	......	......	28·65	......	·87	90	Q
20	......	......	28	......	1·4	S.	......	......	......	......	Q
	34	......	38	32	10·3	S.	28·35	·13	......	83	Q
21	......	......	36	......	1·8	NW.	......	......	......	56	Q
	35	......	40	34	15·0	W.	28·65	·06	·01	84	P
22	......	......	32	......	3·1	S.	......	......	......	90	P
	35	......	51	34	2·7	S.	28·90	......	......	75	P
23	......	......	39	......	4·4	S.	......	·01	......	92	R
	36	......	47	40	7·0	SE.	28·70	·03	......	86	Q
24	......	......	45	......	4·4	SE.	......	......	......	89	R
	36	......	49	42	4·1	SE.	28·60	·01	·02	74	R
25	......	......	44	......	1·4	S.	......	......	......	85	R
	36	......	49	43	2·0	S.	28·37	·02	·01	87	R
26	......	......	53	......	2·0	S.	......	......	......	75	R
	......	......	56	48	......	......	28·47	·05	......	82	R
27	......	......	36	......	5·1	N.	......	......	......	73	R
	37	......	36	32	6·7	NE.	28·75	·01	......	65	R
28	......	......	30	......	10·0	NE.	......	......	......	89	Q
	35	......	38	30	13·2	N.	28·80	......	......	83	P
29	......	......	36	......	7·5	N.	......	......	......	91	R
	35	......	54	37	3·6	SE.	28·95	·18	......	48	R
30	......	......	41	......	4·2	S.	......	......	......	69	Q
	36	......	45	35	3·4	S.	28·95	·01	......	79	Q

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR MAY, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity.	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	...	...	43	...	4·0	S.	...	·01	·02	88·0	Q
	37	...	63	50	4·1	SW.	28·65	·02	...	51·0	Q
2	...	...	54	...	4·2	SW.	...	...	...	76·0	Q
	38	...	64	52	2·6	S.	28·41	...	...	77·0	Q
3	...	...	51	...	3·0	SE.	...	...	...	94·0	...
	38	...	...	48	4·8	SW.	28·35	...	...	...	...
4	...	...	52	...	2·1	NE.	...	...	...	94·0	P
	38	...	67	56	1·8	NE.	28·30	...	...	67·0	P
5	...	...	50	...	3·8	S.	...	...	...	77·0	P
	38	...	70	54	5·4	S.	28·40	...	...	...	R
6	...	...	43	...	3·2	S.	...	...	...	92·0	R
	38	...	42	40	6·5	NE.	28·45	...	...	88·0	R
7	...	...	46	...	3·8	E.	...	...	...	93·0	P
	38	...	64	44	4·3	N.	28·70	...	...	57·0	P
8	...	...	...	...	2·7	S.	...	...	...	...	Q
	40	...	60	44	7·9	SW.	28·65	...	...	63·0	Q
9	...	...	...	...	3·5	S.	...	...	...	...	...
	40	...	56	45	2·8	NW.	28·40	·02	...	77·0	Q
10	...	...	48	...	...	...	...	...	...	79·0	...
	39	...	...	40	5·1	N.	28·75	...	...	...	...
11	...	...	44	...	2·2	NE.	...	...	...	78·5	P
	39	38	...	...	4·0	NE.	28·95	...	...	...	...
12	...	...	44	...	2·2	S.	...	...	...	85·0	P
	38	38	...	48	7·2	W.	29·00	...	...	...	...
13	...	...	53	...	5·0	NE.	...	·08	...	75·0	Q
	40	40	55	44	5·3	NE.	28·95	·01	...	49·0	Q
14	...	...	48	...	2·6	N.	...	·08	...	87·0	P
	42	42	66	43	4·7	W.	29·00	·01	...	62·0	P
15	...	...	52	...	2·2	S.		·02	...	63·0	P
	42	42	55	44	3·6	S.	28·90	·00	...	52·0	P
16	...	...	60	...	2·8	N.	...	·06	...	67·0	Q
	42	42	72	52	...	...	28·80	·00	...	45·0	Q
17	...	...	62	...	5·4	S	...	...	...	60·0	...
	43	44	63	58	8·3	S.	28·75	...	...	60·0	Q
18	...	...	58	...	5·7	S.	...	...	...	73·0	...
	42	42	60	56	6·2	W.	28·75	...	·04	76·0	Q
19	...	...	63	...	1·8	S.	...	...	·20	74·0	R
	46	46	58	54	3·0	S.	28·70	...	·25	72·0	R
20	...	...	56	...	2·4	S.	...	...	...	83·0	Q
	48	48	72	55	2·0	S.	28·70	...	·01	72·0	Q
21	...	...	50	...	1·0	W.	...	...	...	87·0	Q
	44	44	56	49	19·8	NW.	28·75	...	·01	77·0	Q
22	...	...	46	...	1·8	S.	...	...	...	87·0	Q
	43	43	52	45	9·5	S.	28·80	·03	·02	50·0	R
23	...	...	50	...	4·3	W.	...	·06	...	50·0	Q
	46	46	61	45	3·5	W.	28·72	·02	...	49·0	Q
24	...	...	59	...	3·6	SE.	...	·05	...	67·0	R
	48	48	67	55	4·8	S.	28·45	...	...	71·0	P
25	...	...	61	...	4·4	S.	...	...	...	89·0	R
	47	48	77	60	19·4	W.	28·20	...	·38	53·0	R
26	...	...	63	...	15·0	W.	...	...	...	84·0	P
	47	48	75	60	32·2	W.	28·47	·02	...	63·0	P
27	...	...	64	...	5·0	S.	...	...	...	70·0	P
	48	48	74	58	3·6	S.	28·78	·02	...	54·0	P
28	...	...	63	...	2·5	S.	...	...	...	74·0	Q
	50	50	59	56	6·8	S.	28·60	·03	·13	89·0	Q
29	49	50	56	...	34·2	W.	...	...	...	88·0	P
	50	52	64	55	21·4	W.	28·57	...	·72	52·0	Q
30	49	49	60	...	4·8	...	...	·05	...	58·0	Q
	51	53	73	57	9·0	S.	28·73	·03	...	44·0	R
31	...	...	...	...	...	...	...	...	...		...
	...	...	...	55	...	...	28·80	...	...		...

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

Meteorological Data for M.H.S. Station at Keewatin, Ont., for June, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1......	52	52	57·5	......	6·7	S.	....	....	......	91	P
	57	58	70·5	60	2·2	W.	28·80	·18	......	86	Q
2......	53	53	64·6	......	2·7	S.	....	....	......	87	P
	57	58	74·0	60	4·0	S.	28·63	·04	......	78	R
3......	53	54	64·0	......	4·4	S.	....	....	1·72	90	Q
	......	......	65·0	62	8·0	S.	28·50	·05	......	80	Q
4......	53	54	58·0	......	13·2	....	....	·04	......	88	Q
	......	......	68·0	55	11·4	E.	28·65	·03	......	67	Q
5......	52	52	54·0	......	13·3	E.	....	·06	......	88	P
	55	56	68·0	56	14·2	S.E.	28·65	·06	......	71	P
6......	54	54	56·0	......	13·3	S.	....	....	......	82	R
	......	......	70·0	60	8·3	E.	28·45	....	......	81	Q
7......	......	60	74·0	......	6·2	SE.	....	....	......	74	P
	......	......	77·0	70	....	....	28·42	....	......	63	Q
8......	61	62	67·0	......	4·7	SW.	....	....	·42	75	Q
	64	64	79·0	76	3·6	SE.	28·87	....	1·25	79	Q
9......	58	59	63·0	......	6·6	W.	....	....	1·12	84	R
	......	......	76·0	64	7·7	SW.	28·53	....	......	59	Q
10......	57	57	66·0	......	10·4	....	....	·04	......	90	P
	60	61	72·0	63	13·0	W.	28·45	·03	......	86	P
11......	56	56	58·0	......	3·9	N.W	....	·03	......	88	R
	......	......	64·0	55	7·7	W.	28·70	·03	·02	70	Q
12......	57	57	61·0	......	4·7	W.	....	·04	......	88	P
	60	60	74·0	55	10·1	NW.	28·73	·05	......	74	P
13......	58	58	60·0	......	4·5	SE.	....	·05	......	83	P
	59	60	70·0	58	12·2	SW.	28·90	·05	......	48	P
14......	60	60	78·0	......	27·2	N.	....	·06	......	46	R
	60	60	66·0	60	10·6	N.	28·94	·02	......	44	P
15......	59	58	63·0	......	3·3	S.	....	·05	......	64	P
	64	64	76·0	60	4·4	SW.	29·00	·05	......	82	P
16......	60	60	68·0	......	5·3	SW.	....	·05	......	85	P
	60	60	76·0	60	11·2	SW.	29·13	....	......	66	P
17......	60	60	67·0	......	....	....	....	·03	......	90	P
	66	68	73·0	65	7·9	SW.	28·65	....	......	86	P
18......	58	58	48·0	......	5·9	NE.	....	·05	......	86	R
	60	60	64·0	56	11·1	NE.	28·65	·08	......	65	P
19......	58	57	54·0	......	10·9	NE.	....	·06	......	76	P
	......	......	62·0	50	4·4	SW.	28·70	....	......	64	R
20......	61	......	64·0		....	....	....	....	......	90	P
	63	63	79·0	72	6·8	W.	28·70	·05	......	57	P
21......	66	66	74·0	......	8·7	NE.	....	·08	......	61	P
	64	64	73·0	62	....	....	28·85	·03	......	57	P
22......	62	62	61·0	......	5·0	S.	....	·03	·09	89	Q
	63	63	70·0	60	5·2	W.	28·60	....	·05	81	Q
23......	62	62	70·0	......	9·3	SW.	....	....	......	86	P
	......	......	......	62	....	....	28·55	....	......		
24......	62	62	68·0	......	6·9	W.	....	·12	......	85	P
	64	64	69·0	60	12·3	NW.	28·85	·08	......	95	P
25......	61	61	62·0	......	6·4	N.	....	·06	......	79	Q
	63	63	63·0	54	4·5	N.	28·85	....	......	55	R
26......	61	60	62·0	......	2·4	SE.	....	·06	......	74	P
	64	63	74·0	56	10·3	SE.	28·76	·26	......	43	P
27	61	60	61·0	......	12·8	E.	....	·03	......	89	R
	62	62	66·0	62	14·2	E.	28·65	·09	......	61	R
28	64	64	68·0	......	3·3	S.	....	·09	......	62	Q
	63	63	66·0	58	....	....	28·76	·03	......	61	Q
29	63	62	67·0	......	1·7	S.	....	·05		71	P
	63	63	71·0	60	3·7	NW.	28·85	·09		64	Q
30	......	......	65·0	......	2·7	SW.	....	·03	......		Q
	......	......	......	58	1·7	S.	28·75	....			

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR JULY, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	......	......	......	......	......	N.	......	......	......	......	P
	65	65	75	65	2·3	NW.	28·53	·16	·02	78	P
2	61	61	68	......	5·5	SW.	......	......	......	81	S
	66	66	75	64	5·8	SW.	28·55	·05	·00	70	S
3	64	64	69	......	5·0	SW.	......	·02	......	85	Q
	68	70	73	68	2·9	W.	28·45	·06	·07	73	......
4	66	66	72	......	1·2	S.	......	......	......	77	......
	73	74	78	62	2·9	S.	28·59	·00	·04	60	......
5	68	68	74	......	2·8	S.	......	·03	·00	78	......
	70	70	78	70	6·1	S.	28·52	·04	......	75	......
6	70	70	72	......	7·3	W.	......	·00	·01	86	......
	67	67	67	65	12·7	W.	28·35	·02	·00	75	......
7	66	66	64	......	11·5	N.	......	......	·00	70	......
	......	......	......	68	5·1	N.	28·75	......	·00	......	......
8	68	68	66	......	2·8	S.	......	·18	·00	73	Q
	69	69	71	64	6·3	SE.	28·59	......	·00	......	......
9	69	69	71	......	5·2	SE.	......	......	·43	86	P
	......	......	......	76	5·7	SE.	28·53	·00	·00	......	P
10	69	69	70	......	4·8	SW.	......	·02	·01	83	S
	69	70	73	68	1·0	SW.	28·53	·06	·03	84	S
11	......	......	......	......	6·8	SE.	......	·02	·00	95	Q
	......	......	......	65	8·0	E.	28·48	......	......	......	......
12	70	70	69	66	4·7	N.	......	......	......	......	......
	......	......	......	......	......	......	28·44	......	1·05	95	S
13	70	71	74	......	10·6	N.	......	·04	·01	86	P
	73	74	80	......	7·5	SW.	28·52	·05	·00	79	P
14	73	73	77	......	4·7	SW.	......	·03	·00	87	P
	75	76	79	70	24·0	S.	28·33	......	......	......	R
15	72	72	71	......	22·9	SW.	......	·10	·46	100	R
	73	73	70	71	......	......	28·60	·05	·00	95	R
16	69	69	61	......	8·7	W.	......	·00	·00	94	Q
	70	70	66	58	14·8	W.	28·83	·07	·07	90	Q
17	68	68	49	......	11·5	N.	......	·01	·19	100	R
	70	70	66	55	9·6	SW.	28·45	·13	·01	80	P
18	68	68	63	......	3·5	SW.	......	·09	·00	79	P
	70	71	70	63	7·0	SW.	28·57	·05	·01	72	P
19	70	70	65	......	4·7	......	......	·05	·00	90	P
	70	71	70	64	1·9	......	28·69	·08	·00	90	P
20	68	69	72	......	4·7	E.	......	·04	·00	75	P
	76	77	84	73	1·9	......	28·60	·02	·00	84	P
21	71	71	75	......	3·9	S.	......	·05	·00	74	P
	73	73	77	76	8·6	W.	28·66	......	·00	79	P
22	69	69	65	......	5·2	W.	......	·08	1·00	80	P
	71	71	73	66	......	......	28·47	·03	......	65	P
23	69	69	65	......	3·8	SW.	......	·03	......	85	P
	68	......	......	67	4·6	SW.	28·50	......	......	85	P
24	70	70	69	......	2·3	SW.	......	·09	......	81	P
	73	73	74	71	10·7	SW.	28·52	·06	·02	74	R
25	74	74	78	......	13·9	SW.	......	·01	·02	87	P
	73	73	79	72	14·6	SW.	28·44	......	......	68	P
26	75	76	82	......	......	S.	......	·12	·12	76	P
	74	74	82	77	7·5	S.	28·60	·01	......	80	P
27	73	73	74	......	6·3	S.	......	·03	·01	86	P
	76	76	83	75	9·5	S.	28·58	·09	......	49	P
28	74	74	72	......	7·7	SW.	......	·09	......	82	P
	73	73	77	73	......	SW.	28·72	·02	......	74	P
29	73	73	65	......	6·4	S.	......	·10	......	85	P
	73	74	72	71	4·6	S.	28·68	·04	......	86	P
30	72	72	68	......	3·2	SW.	......	·06	·22	95	S
	75	75	77	72	1·5	SW.	28·56	·04	......	96	P
31	71	71	62	......	6·0	W.	......	·04	......	94	P
	75	75	75	72	4·6	W.	28·65	......	......	100	R

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR AUGUST, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	73	73	71	......	....	....	....	·03	......	60	P
	75	75	76	......	0·8	W.	28·45	·04	......	70	P
2	76	76	76	......	4·1	N.E	....	·06	......	48	P
	73	73	70	......	....	....	28·64	·15	......	68	Q
3	72	72	66	......	3·3	W.	....	·02	·05	90	P
	75	75	82	......	10·3	NW.	28·47	....	......	61	P
4	......	......	......	......	1·9	SE.	....	....	......	......	......
	77	77	83	......	4·5	SW.	28·50	·04	......	80	Q
5	72	72	67	......	9·3	NW.	....	·04	......	95	R
	72	72	72	......	12·0	NW.	28·29	·18	......	77	R
6	71	71	62	......	6·1	NW.	....	·16	......	84	Q
	72	72	68	......	1·2	W.	28·48	·12	......	58	P
7	69	69	62	......	4·3	SE.	....	·12	......	74	P
	73	73	78	......	6·1	SE.	28·43	·16	......	60	Q
8	71	71	68	......	....	....	....	·08	......	81	Q
	71	71	70	......	5·8	S.	28·15	·06	......	71	P
9	70	70	66	......	2·8	W.	....	....	......	66	Q
	71	71	66	......	....	....	28·30	·12	......	90	P
10	71	70	62	......	1·0	N.	....	·08	......	71	Q
	71	71	64	......	....	....	28·51	·12	......	74	......
11	68	68	64	......	5·3	NW.	28·68	·05	......	79	P
	70	70	67	......	3·1	W.	....	·06	......	75	P
12	70	70	65	......	3·1	SW.	....	·08	......	75	P
	69	69	62	......	6·9	S.	28·57	·06	......	79	P
13	68	68	62	......	4·5	W.	....	·02	......	59	P
	68	68	62	......	11·3	NW.	28·51	·09	......	50	P
14	68	68	60	......	9·7	N.	....	·09	......	83	P
	69	69	66	......	6·2	NW.	28·52	·06	......	71	Q
15	67	67	62	......	1·8	S.	....	·02	·01	89	Q
	68	68	62	......	5·4	E.	28·41	·05	·23	69	P
16	73	74	82	......	1·1	S.	....	·09	......	48	Q
	......	......	......	......	....	....	28·28	....	......	......	P
17	68	68	65	......	4·3	N.	....	·07	·16	80	P
	69	70	79	......	3·8	N.	28·46	·06	......	85	P
18	69	69	62	......	1·8	N.	....	·05	......	89	P
	72	72	75	......	1·2	N.	28·61	·05	......	58	Q
19	69	68	62	......	2·3	N.	....	·02	......	89	P
	72	72	72	......	2·3	S.	28·64	·02	......	65	P
20	68	68	66	......	0·7	W.	....	·03	......	80	Q
	70	70	69	......	5·4	NW.	28·61	·05	......	43	P
21	......	......	......	......	2·9	N.	....	....	......	......	......
	......	......	......	......	2·4	N.	....	....	......	......	......
22	68	68	65	......	2·7	SE.	....	·12	......	85	R
	68	68	60	......	....	....	28·55	·07	·25	89	R
23	68	68	58	......	9·6	N.	....	....	·15	83	P
	66	66	55	......	....	....	28·63	·04	......	88	P
24	66	64	50	......	5·7	E.	....	·15	......	74	P
	68	68	56	......	4·3	NE.	28·76	·03	......	77	R
25	64	64	52	......	6·5	E.	....	·12	......	75	P
	64	64	52	......	9·5	NE.	28·84	·03	·21	88	R
26	65	65	54	......	5·2	NE.	....	·08	·14	76	P
	64	64	59	......	4·0	N.	28·72	·03	......	89	R
27	64	64	54	......	0·2	E.	....	·03	......	88	R
	64	64	62	......	1·2	S.	28·77	·06	......	79	R
28	64	64	59	......	3·9	S.	....	·09	......	89	P
	64	64	64	......	6·8	S.	28·54	....	......	79	R
29	64	64	58	......	6·5	W.	....	....	·47	89	R
	66	66	65	......	3·5	S.	28·28	·04	·07	90	R
30	64	64	59	......	1·5	....	....	·03	·03	89	R
	66	66	64	......	....	....	28·43	·09		90	P
31	64	64	62	......	5·1	S.	....	·03	·30	89	
	66	66	72	......	5·5	W.	28·60	·03		82	

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR SEPTEMBER, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	64	64	56	......	4·8	W.	....	·06	......	88	R
	62	62	58	......	4·9	W.	28·32	·09	......	89	R
2	62	62	52	......	8·4	W.	....	·03	......	88	R
	63	63	54	......	9·0	W.	28·34	·05	·10	88	R
3	60	60	48	......	14·1	NW.	....	......	......	87	R
	63	63	64	......	12·6	NW.	28·49	1·05	......	70	P
4	63	63	52	......	4·4	W.		·12	......	88	P
	64	64	64	......	3·5	SE.	28·52	·06	......	75	P
5	62	62	56	......	2·8	E.	....	·02	......	77	R
	62	60	55	......	9·4	E.	28·34	·05	·14	82	R
6	......	......	......	......	3·6	NE.	....	......	......	......	......
	60	59	50	......	......	......	28·50	·14	·17	74	R
7	......	......	......	......	7·8	E.	....	......	......	......	......
	......	......	......	......	......	......	28·05	......	......	......	......
8	......	59	53	......	3·2	E.	....	·16	......	82	P
	60	......	......	......	2·6	E.	28·90	......	......	......	......
9	60	60	57	......	7·6	S.	....	·06	......	83	Q
	59	58	55	......	12·0	S.	28·75	......	·06	94	S
10	59	59	57	......	5·0	SW.	....	......	·53	83	S
	62	62	65	......	3·6	S.	28·52	·02	......	78	P
11	......	......	......	......	2·1	S.	....	......	......	......	......
	65	66	67	......	2·5	S.	28·54	·08	......	76	P
12	62	62	63	......	6·6	S.	....	·02	......	84	P
	......	......	......	......	......	......	28·71	......	......	......	......
13	......	......	......	......	16·7	S.	....	......	......	......	P
	......	......	......	......	......	......	28·60	......	......	......	R
14	......	......	......	......	10·2	W.	....	......	·87	......	......
	......	......	......	......	13·8	S.	28·52	......	......	......	......
15	60	60	56	......	4·9	S.	....	......	......	82	R
	62	62	59	......	8·5	S.	28·52	......	......	68	P
16	60	60	59	......	11·5	W.	....	......	·92	81	P
	60	60	60	......	11·2	W.	28·33	......	......	65	R
17	59	59	52	......	1·5	S.	....	......	......	88	R
	63	63	66	......	8·0	S.	28·83	·07	......	58	P
18	59	59	59	......	9·7	S.	....	·05	·05	89	S
	61	61	64	......	9·7	SE.	28·63	......	......	90	S
19	......	......	......	......	7·4	S.	....	......	......	......	......
	......	......	......	......	9·2	SW.	28·75	......	1·11	......	......
20	......	......	......	......	3·9	NW.	....	......	......	......	......
	......	......	......	......	......	......	28·62	......	·12	......	......
21	......	......	......	......	4·8	W.	....	·05	......	......	......
	60	60	51	......	9·7	N.	28·11	·04	......	87	S
22	58	58	44	......	13·9	NW.	....	·04	......	79	R
	59	59	46	......	13·1	NW.	28·44	......	......	89	Q
23	59	59	51	......	3·1	W.	....	·07	......	84	Q
	60	60	56	......	1·7	E.	28·48	·06	......	69	P
24	56	56	41	......	8·1	N.	....	·06	......	82	Q
	57	57	50	......	8·1	N.	28·54	·04	......	59	P
25	56	56	53	......	2·4	S.	....	·05	......	78	P
	59	59	61	......	5·5	S.	28·73	·06	......	71	P
26	58	58	55	......	3·3	S.	....	·12	......	91	P
	60	60	63	......	3·0	NE.	28·61	......	......	70	P
27	62	62	62	......	10·5	SE.	....	......	......	79	P
	......	......	......	......	......	......	28·67	·09	......	......	......
28	......	......	......	......	13·2	S.	....	......	......	......	......
	58	58	55	......	4·5	S.	28·52	·10	......	82	P
29	58	58	51	......	5·9	NW.	....	·02	......	94	P
	58	58	55	......	3·1	NW.	28·67	·08	......	82	P
30	57	57	56	......	4·4	S.	....	......	......	79	P
	60	60	65	......	4·8	S.	28·64	......	......	64	P

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR OCTOBER, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	57	57	58	......	5·0	SE.	......	·08	......	83	P
	58	58	70	......	8·0	SE.	28·47	·06	......	70	P
2	60	60	64	......	6·3	S.	......	·06	......	77	P
	61	61	68	65	......	......	28·32	·00	......	74	P
3	59	59	64	......	7·3	SE.	......	·08	......	75	S
	58	58	65	66	10·7	S.	28·25	·06	......	75	P
4	60	60	64	......	10·1	SE.	......	·00	......	79	R
	62	62	69	65	......	......	28·24	·02	......	72	R
5	60	62	64	......	4·6	SE.	......	·00	......	85	S
	59	58	58	58	3·3	S.	28·50	·08	·32	83	S
6	58	58	51	......	0·3	E.	......	·03	·03	94	Q
	......	......	......	55	2·1	S.	28·67	......	......	......	......
7	58	58	44	......	2·0	NE.	......	·06	......	71	P
	......	......	......	54	......	......	28·55	......	......	......	......
8	57	57	48	......	4·3	E.	......	·08	......	......	P
	......	......	......	52	......	......	28·37	......	......	......	......
9	58	58	57	......	3·0	W.	......	·03	·07	94	S
	......	......	......	53	......	......	28·37	......	......	......	......
10	56	56	50	......	5·1	SW.	......	·01	·55	87	......
	58	58	48	47	8·4	SW.	28·30	·28	1·64	87	S
11	56	56	42	......	4·8	NW.	......	·05	·11	85	S
	56	56	42	41	......	......	28·48	·02	·16	92	......
12	54	54	36	......	9·8	NE.	......	·02	......	91	R
	54	54	38	40	6·3	NE.	28·86	·10	......	91	P
13	54	54	40	......	1·7	NE.	......	·04	......	76	P
	56	56	48	39	1·4	NW.	29·20	·02	......	87	P
14	54	54	44	......	5·5	W.	......	·10	......	85	P
	54	54	52	47	7·4	W.	28·70	·04	......	88	Q
15	54	54	46	......	6·1	N.	......	·06	......	93	P
	56	56	56	53	5·5	E.	28·54	·02	......	77	P
16	54	54	52	......	5·6	SW.	......	·04	......	88	P
	56	56	62	54	7·4	SW.	28·32	·04	......	89	P
17	54	54	44	......	2·0	NE.	......	·04	......	93	P
	56	56	58	54	3·7	E.	28·33	......	......	89	P
18	56	56	56	......	11·5	SE.	......	·04	......	82	S
	......	......	......	57	......	......	28·18	......	......	......	......
19	54	54	54	......	10·2	SW.	......	·02	......	88	S
	56	56	58	56	5·1	SW.	28·16	·02	......	77	P
20	54	54	54	......	2·4	SW.	......	·04	......	88	P
	56	56	62	58	9·2	SW.	28·31	·02	......	84	P
21	56	56	46	......	3·8	N.	......	·02	......	86	P
	56	56	58	52	2·1	E.	28·73	·02	......	83	P
22	54	54	54	......	8·4	SE.	......	·04	......	88	R
	56	56	60	55	9·6	SE.	28·65	·02	......	89	S
23	54	54	42	......	11·6	N.	......	·08	·20	92	S
	54	54	48	49	14·1	NW.	28·73	·04	......	80	P
24	52	52	42	......	4·8	SW.	......	·03	·01	92	R
	52	52	50	46	13·5	W.	28·71	·06	......	87	R
25	52	52	42	......	10·6	N.W.	......	·04	·02	92	S
	50	50	38	40	......	......	28·53	·02		83	
26	46	46	20	......	15·1	NW.	......	·08	......	85	P
	46	46	30	24	11·1	NW.	28·83	·06		89	P
27	48	48	34	......	8·1	W.	......	·14		90	S
	48	48	44	35	12·9	W.	28·43	·06	......	85	P
28	48	48	38	......	7·0	N.	......	·04		83	S
	48	48	42	40	6·7	N.W	28·34	·04		85	S
29	48	48	38	......	8·6	W.	......	·06		91	P
	48	48	48	43	11·2	NW.	28·49	·04		87	P
30	48	48	42	......	1·8	S.	......	·04		92	R
	48	48	54	45	5·2	S.	28·39	·04		82	P
31	48	48	46	......	3·5	S.	......	·06		93	S
	50	50	52	53	4·8	S.	28·10	·02		88	P

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small, fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR NOVEMBER, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	48	48	40·0		8	N.		·01	·01	84	S
	48	48	40·0	43			28·36	·04		76	P
2	47	48	40·0		9·2	SE.		·08		88	S
	46	46	40·0	41	14·5	SE.	28·37	·04		89	P
3	47	47	44·0		7·3	W.		·04		85	S
	48	48	45·0	44	10·3	W.	28·05	·05	·02	79	S
4	46	46	35·0		12·4	NW.		·03	·19	91	R
	47	46	36·0	36	16·7	NW.	28·51	·03	·03	91	S
5					8·5	N.					
	46	46	32·0	31	2·9	NW.	28·58	·14		74	P
6					4·5	E.					
	46	44	33·0	35			28·39	·04		52	R
7					12·8	NW.					
	45	44	32·0	34	4·6	W.	28·53	·10		79	Q
8	44	44	38·0		11·6	W.		·06	·02	71	P
	44	44	35·0	35		SW.	28·55	·03	·02	95	Q
9	43	42	33·0		5·0	SE.		·02		95	P
				37		SE.	28·25				
10	43	42	34·0		10·4	W.		·06		90	R
	44	44	41·0	38	10·5	W.	28·31	·02		62	R
11	42	41	22·0		11·2	NW.		·05		93	P
	41	40	28·0	27	7·3	NW.	28·62			44	P
12	36	32	15·0		6·9	E.					Q
	38	37	25·0	22	5·8	E.	28·60	·18		50	Q
13	38	36	27·0		3·9	W.				82	S
	36	34	26·0	26	4·3	W.	28·48	·02		82	S
14	34	33	22·0		10·4	E.				79	R
				24			28·25				
15											
				25	8·6	NW.	28·36		·01		R
16	32		12·0		15·3	NW.					R
	32		9·0	16	14·4	NW.	28·59				S
17					9·9	W.					P
	34		4·0	2	9·9	N.W	28·68				P
18			8·0		8·9	N.					Q
	33		1·0	5	16·2	NW.	28·71		·01		P
19			10·0		9·3	W.					P
	33		12·0	8	2·9	S.	28·45				P
20			20·0		8·3	S.					P
	33		24·0	22	3·9	W.	28·26			94	P
21			23·0		9·4	NW.					P
	34			19	16·2	NW.	28·51			85	P
22			8·0		8·4						P
	33		13·0	12	2·1		28·75				P
23			22·0		5·7	S.					P
			31·0	26			28·49			100	P
24			23·0		6·2	SW.				59	P
	34			32	6·6	SW.	28·49				
25			30·0		9·1	SW.				95	P
	34		39·5	35	2·2	S.	28·17			92	R
26			36·0		9·4	NW.					R
	33		19·0	30	15·9	N.	28·32			100	P
27			9·5		4·6	S.					Q
	33		23·0	17	5·1	S.	28·69			100	P
28			27·0		6·9	S.					P
	33		39·5	35	8·9	S.	28·35			88	P
29			41·0							80	P
	34		36·5	38			28·32			81	P
30			36·0		5·0	N.				91	Fog
	34		33·0	37	6·1	N.	28·48			76	R

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR DECEMBER, 1914.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1			33		7·2	E.				95	R
	33		23	29·0	5·9	W.	28·43		·10	73	R
2			18		7·4	NW.				92	S
			19	20·0			28·70		·10	77	Q
3			22		6·2	S.					
	34			26·0			28·78				
4					6·5	S.					
	32		28	27·0	4·7	S.	28·76			100	P
5					13·9	S.					
			28	28·0	4·4	S.	28·84			100	P
6			22								P
			29	28·0			28·89			94	R
7			23							87	Q
	33			27·0			29·03				
8			20								Q
			16	17·0	11·1	N.	29·12				P
9			1		4·9	N.					P
			8	6·0	6·4	N.	29·15				P
10			1		1·1	S.					Q
	32		15	9·5	1·9	SW.	28·88				P
11			13		4·8	W.					P
	32		15	10·0	3·0	S.	28·58				P
12			3			W.					Q
	32		10	7.0	1·0	W.	28·42				P
13			−12								P
			−11	− 3·0	1·1		28·59				P
14			−20		2·1	N.					P
			−12	−12·0	21·9	W.	28·64				P
15			−19								P
			− 8	−12·0			28·86				P
16			− 2								P
			0	− 4·0			28·74				P
17			2								P
			13	+ 6·0			28·33				P
18			12								Q
			13	13·0			28·21				Q
19			13								R
			9	10·0			28·48				P
20			10								Q
			11	7·0			28·41		·20		Q
21			− 2								Q
			−22	−14·0			28·29				P
22			− 4								P
			−22	−18·0			28·48				P
23			−19								P
				−15·0			28·55				
24			−28								P
				−28·0			28·70				
25			−24								P
			− 7	−14·0			28·75				P
26			− 8								Q
			3	− 4·0			28·42				Q
27											
			2	− 3·0			28·68				P
28			− 7								R
			9	+ 3·0			28·28				P
29			− 9								P
			− 7	− 6·0			28·67				P
30			−20								P
				−14·0			28·32				
31			7								R
			13	+ 8·0			28·30				R

Average time of observation:—7.45. a m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR JANUARY, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1											P
	32		7	2			28·47		·30		
2			−21								P
			0	−6			28·83				P
3			10								P
			13	9			28·53				Q
4			15								R
			24	18			28·05				Q
5			12								P
			24	23			28·09				R
6			12								R
			14	20			28·22				P
7			2								P
			4	7			28·65				P
8			8								P
			8	8			28·40				P
9			4								P
			11	11			28·46				P
10			26								R
			27	22			28·38				R
11			3								Q
			21	10	2·8		28·40				P
12			20								R
			30	18	7·3		28·01				Q
13			24		11·1	SW.					R
			12	14	11·0	W.	27·83				Q
14			6		6·2	SW.					R
			6	6	2·7	W.	28·33		·08		R
15			3		2·4	NE.					P
			6	4	1·6	NE.	28·60				P
16			−6		1·2	N.					P
			6	0	7·9	N.	28·57				P
17			6								R
			9	8	5·9	E.	28·33				R
18			6		1·0	S.					R
			10	10	1·7	S.	28·20		·13		R
19			9		4·6	N.					R
			14	13	3·7	N.	28·28				R
20			−10		3·9	N.					P
			−4	−5	4·6	N.	28·65				P
21			−18		3·5	N.					P
			−4	−8		NW.	28·85				P
22			−4		0·9	S.					P
			−6	−5		S.	28·75				P
23			−11		4·6	SW.					Q
			−14	−12	2·5		28·57				P
24			−23								P
			−23	−19	1·0		28·68				P
25			−33		2·4	S.					P
			−16	−25	1·5	S.	28·51				P
26			−25		1·7	W.					P
			−14	−23	3·9	W.	28·49				P
27			−35			W.					P
			−24	−30	3·9	W.	28·76				P
28			−24								Q
			−16	−25	5·5	S.	28·58				P
29			−33			S.					P
			−14	−23	1·2		28·75				P
30			−8		2·9	S.					P
			+14	−4	1·1	S.	28·55		·07		P
31			15								R
			8	+7			28·59				P

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

Meteorological Data for M.H.S. Station at Keewatin, Ont., for February. 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1			− 9								P
	32		2	− 2			28·69				P
2			17								Q
			19	8	5·8	S.	28·45				Q
3			19		5·1	S.					R
			24	21			28·30		·40		R
4			24		4·3	E.					R
			26	24	0·7	NE.	28·25				P
5			12		1·2	N.					Q
			15	15	9·2	N.	28·36				P
6			1		5·2	NW.					P
			10	9	7·1	NW.	28·51				P
7			− 6								P
			15	8	3·8	W.	28·76				P
8			10		0·4	NE.					R
			8	11	1·8	NW.	28·79		·10		P
9			25		0·8	S.					P
			21	14	3·7	S.	28·54				R
10			25		3·4	S.					
			20	22	1·7	S.	28·27				Q
11			22		0·5	N.					R
			24	19	2·4	N.	28·52				P
12			0		0·6	S.					P
			16	11	2·4	S.	28·30				P
13			20		0·3	SE.					R
			26	21			28·38				R
14			25								R
			24	23	0·2		28·04		·60		R
15			16		3·9	NW.					R
			12	16			28·48		·30		R
16			4		4·2	SE.					P
			12	9			28·64				P
17			16		0·5	S.					P
			34	22	12·2	S.	28·47				P
18			35		3·7	S.					R
			35	33	3·8	S.	28·47		·06		R
19			31								R
			32	31	0·3	NE.	28·63				R
20			34		0·5	N.					
			34	33	5·0	S.	28·63				R
21			30		7·8	S.					
			28	28		S.	28·68				R
22			20		2·1	NE.					
			25	24	7·9	N.	28·82				P
23			6		4·6	N.					
			28	18	2·7	N.	28·69				P
24			6		2·9	N.					P
			23	16	0·4	N.	28·62				P
25			10		4·7	E.					P
			18	14	3·4	NE.	28·75				P
26			3		3·9	S.					P
			17	10	3·4	S.	28·87				P
27			3		1·0	S.					P
			17	11	2·9	S.	28·89				P
28			14								Q
			15	15	2·8		28·65				R

Average time of observation:—7.45. a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR MARCH, 1915.

Day	Temperature				Velocity Wind	Direc-Wind tion	Baro-meter	Evapor-ation	Rain	Humi-dity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1					4·5	W.					R
			+ 7·0	+16·0	4·3	NW.	28·56		·03		Q
2			− 7·0								P
			+ 6·0	0.0	20·8	SE.	28·80				P
3			+ 1·0		0·2	S.					P
			+15·0	+ 7·0			28·92				P
4			+14·0		1·0	S.					R
			+27·0	+17.0	0·8	NE.	28·99				P
5			+19·0		1·8	N.					Q
			+29·0	+23·0	3·9	N.E	28·80				Q
6			+17·0		4·6	N.					P
			+30·0	+23·5			28·76			89	P
7			+17·0		1·6	N.					P
			+30·0	+23·0			28·85			95	P
8			+17·0		0·3	S.					P
	34		+34·0	+24·0			28·73			69	P
9					0·3	S.					P
			+30·0	+24·0	1·4	S.	28·67			58	P
10			+19·0								P
			+35·0	+26·0			28·67			82	P
11			+20·0								P
	35		+36·0	+29·0			28·65			50	P
12			+22·0								P
			+35·0	+29·0			28·62			77	P
13			+28·0		3·4	S.					R
	33		+31·0	+28·0	2·7	S.	28·61				R
14			+30·0								R
			+33·0	+31·0			28·54			85	P
15			+32·0		5·0	N.					P
	34		+34·0	+31·0	7·5	N.	28·64			58	P
16			+24·0		1·9	S.					P
	35		+34·0	+30·0	4·2	W.	28·65			77	P
17			+30·0		4·2	W.					P
			+34·0	+32·0			28·40			81	P
18			+16·0		4·0	N.					P
	33		+23·0	+21·0	24·5	N.	28·49				P
19			+20·0		12·4	N.					R
			+20·0	+19·0	15·5	N.	28·51		·17		P
20			+22·0		8·1	N.					P
	34		+31·5	+24·0			28·66			89	P
21			+28·0							94	P
			+36·0	+29·0			28·57			82	P
22					4·6	N.					
				+32·0							
23			+32·0		5·4	S.					R
	35		+38·0	+34·0	3·5	S.	28·15		·20	83	R
24			+26·0		9·2	N.					R
			+18·0	+24·0			28·33				R
25			+ 3·0		14·1	N.					R
				+18·0	10·2	N.	28·83				
26			+23·0								P
			+32·0	+21·0	10·4	W.	28·64				P
27			+30·0								S
			+20·0	+22·0	9·2	N.	28·39			84	P
28											
			+18·0	+11·0	6·0	N.	28·61				P
29			+10·0		12·9	N.					P
			+24·0	+14·0	7·3	NW.	28·59			55	P
30			+19·0		6·8	N.					R
			+32·0	+22·0	7·9	N.	28·69			60	P
31			+28·0		5·6	N.				71	Q
			+38·0	+29·0			28·73			67	P

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR APRIL, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	......	28·0	28	......	6·8	N.	......	......	......	94	P
	......	......	......	28·5	9·7	N.	28·76	......	......	......	......
2	......	......	......	......	6·7	S.	......	......	......	......	......
	35·0	......	35	30·0	3·2	S.	28·77	......	......	55	P
3	......	......	36	......	6·6	S.	......	......	......	......	R
	36·0	......	44	39·0	8·3	S.	28·37	......	......	57	R
4	......	......	44	......	......	......	......	......	......	78	R
	......	......	44	40·0	......	......	28·19	......	......	78	S
5	......	......	36	......	5·0	E.	......	......	......	91	S
	36·0	......	39	36·0	......	......	28·41	......	·14	92	R
6	......	......	34	......	3·0	W.	......	......	......	......	Q
	37·0	......	42	37·5	......	......	28·65	......	......	62	P
7	......	......	36	......	2·9	W.	......	......	......	79	P
	37	......	48	42·0	3·2	W.	28·66	......	......	51	Q
8	......	......	41	......	2·8	S.	......	......	......	88	S
	37·5	......	47	46·0	2·7	S.	28·51	......	......	63	S
9	36·0	......	42	......	1·6	S.	......	......	......	96	Fog
	......	......	......	40·5	......	......	28·29	·025	......	......	......
10	37·0	37·0	42	......	7·8	SW.	......	......	......	77	S
	36·5	......	43	46·0	......	......	28·10	·025	......	70	......
11	38·0	38·0	43	39·0	1·3	......	28·57	·015	......	71	......
	......	......	......	......	......	......	......	......	......	......	P
12	......	......	......	......	6·2	S.	......	......	......	......	P
	......	......	47	39·0	5·7	S.	28·70	......	......	......	P
13	......	......	......	......	5·7	S.	......	......	......	......	P
	38·0	......	52	44·0	6·6	S.	28·59	......	......	76	P
14	37·5	37·5	43	......	5·4	S.	......	......	......	85	P
	38·0	38·0	60	50·0	4·6	S.	28·50	......	......	66	P
15	39·5	39·5	51	......	6·7	N.	......	·02	......	90	S
	......	......	......	53·0	8·5	N.	28·61	......	......	......	P
16	41·0	41·0	66	......	4·3	S.	......	·02	......	......	P
	44·5	44·5	67	51·0	2·9	S.	28·69	......	......	......	P
17	40·0	40·0	48	......	5·8	S.	......	·05	......	60	S
	44·0	46·0	58	48·0	6·4	S.	28·29	·07	·07	72	Q
18	44·5	44·5	56	......	4·7	NW.	......	·03	......	74	P
	......	......	......	51·0	......	......	28·23	......	......	......	......
19	44·0	44·0	51	......	13·2	NW.	......	·12	......	90	P
	44·5	44·5	60	52·0	1·4	NW.	28·40	·11	......	73	P
20	41·5	40·0	40	......	6·0	SE.	......	·03	......	......	P
	44·0	46·0	58	45·0	3·3	SE.	28·61	·07	......	67	P
21	......	......	......	......	10·2	S.	......	......	......	......	......
	44·5	44·5	61	51·5	7·1	S.	28·22	·08	......	77	P
22	44·0	42·0	49	......	6·6	S.	......	·03	......	93	R
	......	......	......	52·0	......	......	28·26	......	......	......	......
23	44·0	43·0	47	......	9·1	N.	......	·04	·50	89	R
	......	......	......	47·0	15·1	......	28·36	......	......	......	......
24	44·0	43·0	48	......	2·9	N.	......	......	·71	......	Fog
	45·0	45·0	60	55·0	1·6	N.	28·29	......	......	63	Q
25	46·0	46·0	58	......	2·2	W.	......	......	·07	77	Q
	......	......	......	51·0	......	......	28·27	......	......	......	......
26	43·5	43·5	44	......	8·0	W.	......	......	......	......	P
	47·0	46·5	57	50·5	1·2	S.	28·41	·02	......	85	R
27	44·0	44·0	52	......	2·5	N.	......	......	·26	91	Fog
	45·0	45·0	63	53·0	1·7	NW.	28·11	·02	......	67	Q
28	......	......	......	......	6·3	NW.	......	......	......	......	......
	47·0	47·0	56	49·0	24·5	NW.	28·16	......	......	71	Q
29	46·5	46·5	49	......	15·2	NW.	......	·05	......	93	P
	47·0	47·0	62	52·0	17·7	N.	28·44	·07	......	74	P
30	43·0	43·0	45	......	11·6	NE.	......	·01	......	93	Q
	......	......	......	46·5	13·0	NE.	28·45	......	......	......	......

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR MAY, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	45·0	45·0	47·0		9·8	NE.		·05			R
				50	15·1	NE.	28·59				
2					10·7	E.					
				43							
3	44·5	44·0	48·0		11·2	E.		·13		87	R
	46·0	46·0	54·0	47	10·3	E.	28·40	·03	·03	94	R
4	45·0	45·0	49·0		4·2	N.		·04	·07	87	Q
	47·0	47·0	58·0	53	4·0	N.	28·28	·03		83	Q
5	45·0	46·0	48·0		3·2	W.		·01		93	R
	43·0	43·0	45·0	47	9·4	NW.	28·18			82	R
6	41·0	41·0	40·0		7·9	N.		·02	·12	92	S
	42·5	42·5	45·0	42	3·3	N.	28·13	·02	·36	86	
7	41·0	41·0	38·0		7·6	NW.			·35		S
				39	15·0	N.	28·05			69	P
8	40·0	40·0	34·0		13·9	N.			·42	90	S
	44·0	44·5	51·0	41	15·1	N.	28·17	·07			
9	45·0	47·0	61·0		7·9			·035	·005	50	P
	45·0	48·0	62·0	48				·05		39	P
10	47·0	47·0	48·0		7·3	E.		·03		87	P
	48·0	49·0	65·0	55			28·29	·06		70	P
11	47·0	47·0	55·0		11·3	S.			·32	94	R
				57	5·1	W.	28·20				
12	47·0	48·0	52·0		4·0	N.			·22	91	S
	46·0	45·5	52·0	51			28·49		·03	81	S
13	45·0	45·0	48·0		3·8	E.					S
	50·0	50·5	59·0	52			28·59			81	P
14	48·0	48·0	55·0		2·5	W.		·02		76	P
	48·0	49·0	72·0	56	7·2	E.	28·52	·07		32	Q
15	47·0	47·0	51·0		10·9	E.		·03		75	R
	47·0	47·0	50·0	49	14·1	E.	28·45	·05		87	R
16	48·0	49·0	51·0					·04		94	Q
	47·0	47·0	43·0	44			28·61	·10		63	P
17	46·0	43·0	43·0		1·2	E.		·04	·09	43	Q
				38			28·58				
18					4·5	N.					
	47·0	45·0	46·0	48				·08		46	P
19	50·0	51·0	58·0		3·1	S.				62	P
				50			28·73	·09			
20	50·0	52·0	54·0		3·2	S.		·06		70	P
				55			28·51				
21	52·0	54·0	69·5							61	Q
				53	3·4	E.	28·32	·10			
22	50·0	50·0	60·0		5·3	W.		·05		84	P
	51·0	53·5	67·0	56	7·0	SW.	28·35	·03		71	P
23	50·0	50·0	56·0		4·2	W.		·03		82	R
	52·0	54·0	61·0	54			28·42	·035	·005	74	R
24	52·0	54·0	60·0		4·4	N.		·01		78	P
				54			28·45				
25	52·0	52·0	54·0		6·6	E.		·04		88	R
	54·0	56·0	68·0	58	11·4	E.	28·48	·08		55	P
26	51·0	52·0	51·0		3·5	S.		·02		97	P
	56·0	60·0	65·0	52	5·2	S.	28·68	·04		70	P
27	53·0	53·0	53·0		1·1	S.		·03		94	Q
	60·0	56·0	67·0	55	3·9	SE.	28·63	·07		71	P
28	53·0	54·0	55·0		2·6	SE.		·01		88	R
				57			28·47				
29	54·0	54·0	58·5		3·3	E.		·04		94	Q
	57·0	59·0	75·0	62	6·4	E.	28·50	·10		51	P
30	58·0	59·0	72·0		3·5	NE.		·06		59	P
	60·0	63·0	72·0	57			28·56	·03		57	P
31	56·0	57·0	56·0		1·7	E.		·03		88	P
	62·0	64·0	71·0	59	1·8	S.	28·59	·04		67	P

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION AT KEEWATIN, ONT., FOR JUNE, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	58·0	59·0	61·0	......	4·2	SE.	....	·03	......	84	P
	61·0	64·0	69·0	63	4·3	N.	28·59	·01	......	81	R
2	61·5	60·5	64·0	......	2·0	S.	....	·01	......	95	P
	62·0	62·0	77·0	66	....	....	28·44	·04	......	75	P
3	61·0	60·5	60·0	......	2·0	E.	....	·02	......	......	P
	65·5	66·0	74·0	67	5·3	S.	28·55	·07	......	72	Q
4	61·0	61·0	64·0	......	5·2	S.	....	·03	......	85	P
	......	......	......	67	11·0	S.	28·44	......	......	......	......
5	62·0	62·0	65·0	......	17·1	W.	....	......	·45	90	R
	61·5	61·0	62·0	63	5·5	W.	28·12	·05	·15	92	R
6	59·0	58·0	44·6	......	5·0	N.	....	·03	·10	93	......
	......	......	......	45	....	....	28·31	......	......	......	......
7	58·0	56·0	44·0	......	13·8	N.	....	·10	......	82	Q
	58·0	58·0	52·0	48	4·7	NE.	28·42	·08	......	79	Q
8	58·0	57·0	39·0	......	8·1	NE.	....	·02	·38	88	R
	59·5	60·5	52·5	48	7·9	NW.	28·50	·04	·17	88	P
9	58·0	58·0	52·5	......	2·6	S.	....	·04	......	70	P
	60·0	61·0	58·0	53	4·8	W.	28·53	·07	......	89	Q
10	59·0	58·0	52·0	......	7·6	SE.	....	·02	·05	85	S
	58·0	57·0	50·0	52	6·7	E.	28·34	·01	·53	73	S
11	57·0	57·0	52·0	......	3·2	N.	....	·02	·03	88	Q
	58·0	60·0	58·0	54	3·0	S.	28·35	·06	......	86	P
12	......	......	......	......	2·9	SE.	....	......	......	88	......
	58·0	58·0	54·0	53	5·1	E.	28·32	·06	......	......	R
13	58·0	59·0	58·0	......	15·2	S.	....	·03	......	80	P
	59·0	60·0	59·0	58	....	....	28·39	·07	......	81	R
14	58·0	59·0	61·0	......	2·5	S.	....	·03	·30	86	Q
	......	......	......	51	11·5	W.	28·35	......	......	......	
15	......	......	......	......	7·2	W.	....	......	·13	......	......
	58·0	58·0	56·5	60	9·0	W.	28·36	......	......	85	R
16	57·0	56·0	45·0	......	8·1	N.	....	·09	·44	65	Q
	58·0	59·0	58·0	51	11·3	N.	28·39	......	......	64	P
17	57·0	56·0	54·5	......	1·8	S.	....	·03	......	76	P
	......	......	......	50	6·4	SE.	28·49	......	......	......	......
18	56·0	55·0	49·5	......	6·7	N.	....	·07	·15	55	R
	56·0	57·0	53·5	53	10·3	N.	28·44	·05	......	91	S
19	57·0	57·0	53·0	......	3·7	N.	....	·035	·005	88	P
	59·0	60·0	62·0	55	4·1	W.	28·51	·04	......	87	R
20	59·0	59·0	59·0	......	....	....	....	·02		89	P
	......	......	......	57	....	....	28·55				
21	58·0	58·0	56·5	......	6·1	S.	....	·04	·68	94	P
	......	......	......	58	22·3	W.	28·21				
22	55·0	55·0	46·0	......	6·5	N.	....	·07	·06	87	Q
	58·5	58·5	61·0	56	5·8	W.	28·55	·08		74	P
23	56·0	56·0	53·0	......	....	....	....	·01	·34	88	R
	58·0	58·5	65·0	57	5·9	N.	28·45		·02	78	Q
24	56·0	56·0	65·0	......	3·7	SW.	....	·02			P
	57·5	58·0	62·0	58	6·0	SW.	28·51	·04		74	P
25	55·0	55·0	55·0	......	5·3	S.	....	·01	·40		R
	62·5	62·5	68·0	60	3·4	S.	28·40			76	P
26	59·5	59·5	58·0	......	3·2	SE.	....	·02		84	P
	......	......	......	63	10·7	S.	28·39				
27	59·5	60·0	64·0	......	6·2	S.	....	·05	·28	95	S
	......	......	......	67			28·38				
28	59·5	59·5	61·0	......	4·5	W.		·01		84	S
	65·0	65·0	71·0	66	5·5	SW.	28·52	·02	·01	77	S
29	62·0	62·5	60·0	......	5·7	W.				84	P
	55·5	55·5	68·0	64			28·47	·05		90	P
30	61·0	61·0	61·0	......	5·7	N.	....	·06		74	P
	61·0	63·0	68·0	64	4·4	NW.	28·27	·04	·08	78	Q

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION, KEEWATIN, ONT., FOR JULY, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	60·0	60·5	60	59	5·6	W.	......	·02	..	73	S
	.....	.....	.....	.....	......	......	28·32	......	..	....	..
2	59·0	59·0	49	.....	4·9	W.	......	·11	·09	90	Q
	60·5	61·0	62	53	5·8	W.	28·25	·04	·02	55	Q
3	60·0	60·0	49	.....	1·1	W.	......	·03	..	70	P
	62·0	63·0	63	54	2·1	S.	28·22	·05	...	65	S
4	.....	.....	.....	.....	7·1	N.	......	......	..	....	..
	60·0	61·0	62	53	......	......	28·34	·07	..	56	Q
5	59·0	58·5	47	....	9·2	N.	......	·03		90	P
	63·0	63·5	68	58	......	......	28·40	·07	.	72	P
6	62·5	62·5	59	....	2·0	W.	......	·03	..	68	P
	67·0	68·0	72	64	2·9	S.	28·37	·05		82	P
7	.....	.....	.....	....	0·7	W.	......	......		...	.....
	69·0	69·0	70	66	1·0	S.	28·41	·07		90	P
8	63·0	63·0	63	.....	1·0	SW.	......	·04	..	....	P
	68·0	68·5	77	67	5·9	W.	28·48	·06		75	P
9	63·0	63·0	65	..	5·2	S.	......	·03		90	R
	.....	.....	.....	64	12·4	S.	28·32	....		....	.....
10	63·0	62·5	64	.....	9·5	S.	......	......	·39	95	S
	64·0	65·0	72	67	7·2	S.	28·14	·01	.....	93	S
11	65·0	65·0	69	.....	8·4	SE.	......	·02	....	93	R
	.....	.....	.....	67	......	......	28·18	.....	.....	....	.....
12	65·0	65·0	64	.....	3·4	S.	......	·01	·15	90	P
	67·0	67·5	74	67	7·1	S.	28·31	......	·31	70	P
13	65·0	65·5	66	....	1·3	S.	......	·03	·27	92	Q
	71·0	70·0	76	70	4·9	N.	28·36	·03	.....	74	Q
14	65·0	65·0	63	....	5·4	NE.	......	·03	..	83	P
	64·0	64·5	71	66	11·2	E.	28·39	·03	.	86	Q
15	65·0	65·0	64	.....	6·1	SE.	......	·02	.	95	R
	65·5	65·5	67	66	6·3	SE.	28·30	·02	...	85	R
16.	65·0	64·0	60	....	6·0	NW.	......	·05	·15	89	R
	66·0	66·0	66	65	9·6	W.	28·19	·05	....	80	S
17	64·5	64·0	56	....	9·0	N.	......	·10	·05	79	R
	64·5	64·0	61	59	6·6	E.	28·42	·01	....	83	R
18.	64·5	64·0	63	....	0·9	E.	......	·03	..	68	Q
	64·0	64·5	60	58	......	....	28·46	·04	·01	83	S
19.	64·0	64·5	55	.....	6·7	N.	......	·04	.....	74	P
	64·5	65·5	67	62	1·0	W.	28·57	·06	....	73	R
20	64·5	64·5	58	.....	6·3	N.	......	·03	...	94	P
	64·5	64·5	61	62	4·4	NW.	28·67	·05	·14	84	S
21	64·5	64·5	58	....	1·1	W.	......	·03	.	84	P
	66·0	67·5	70	64	3·1	W.	28·64	·07	.	68	P
22	65·5	66·0	63	....	4·1	S.	......	·04		84	P
	66·5	67·0	71	67	7·2	S.	28·49	·04		73	R
23	64·0	63·5	56	....	5·3	NE.	......	·04	·04	82	S
	64·5	65·0	66	62	10·2	E.	28·55	·08	.....	51	P
24	64·0	63·5	50	.....	4·2	S.	......	·05	...	67	P
	69·0	69·5	69	59	2·3	S.	28·70	·05	..	44	Q
25	67·5	69·0	68	...	2·7	S.	......	·07		83	P
	.....	.....	....	61	.....	......	28·73	....	..	..	.
26	67·0	67·0	58	....	2·5	S.	......	·10		94	P
	67·0	67·0	69	64	3·8	S.	28·68	·07		59	Q
27	66·5	66·0	62	..	0·9	N.	......	·03	.	79	Q
	67·5	68·5	76	66	5·1	W.	28·56	·07	..	45	P
28	66·0	66·5	64	.	2·9	S.	......	·04	...	84	P
	...	...	...	69	8·1	S.	28·44	.....	...	...	..
29	65·5	65·0	66		6·9	S.	......	·05	·03	85	S
	65·5	66·5	70	68	8·6	NW.	28·42	·02	....	56	Q
30	65·0	64·5	60	...	2·7	W.	......	·03	..	84	S
	66·0	66·5	70	64	6·7	NW...	28·45	·06		55	Q
31	65·5	65·0	52	.....	3·5	N.	......	·04		88	P
	65·0	66·0	63	59	4·0	N.	28·56	·04	.	52	S

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

Meteorological Data, for M.H.S. Station, Keewatin, Ont., for August, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1.	66·5	67·0	63	......	5·7	N.	....	·07	·18	58	Q
	......	......	......	61	....	....	28·67	......	......	......	......
2.	65·5	64·5	53	......	6·9	E.	....	·14	......	94	P
	......	......	......	60	5·3	E.	28·77	......	......	......	......
3	66·0	65·0	54	......	2·9	S.	....	·15	......	75	Q
	69·0	68·5	70	62	3·8	S.	28·70	·08	......	72	P
4	67·0	66·0	54	......	0·4	N.	....	·07	......	......	P
	69·5	70·5	79	66	1·8	W.	28·57	·05	......	72	Q
5.	67·0	67·0	59	......	3·7	N.	....	·05	......	......	P
	70·0	70·0	80	71	2·0	W.	28·44	·06	......	47	P
6.	67·0	68·0	68	......	4·9	W.	....	·05	......	81	S
	66·5	66·0	77	70	7·4	W.	28·41	·04	·04	58	S
7.	67·0	66·5	63	......	4·1	N.	....	·04	·12	90	S
	68·0	69·0	77	70	3·5	W.	28·45	·05	......	59	S
8.	70·5	73·0	75	......	2·5	S.	....	·05	......	59	P
	......	......	......	71	....	....	28·55	......	......	......	......
9.	71·5	71·5	67	......	1·3	S.	....	·10	......	......	P
	74·5	75·0	81	74	3·0	S.	28·61	·04	......	66	P
10	70·5	70·5	69	......	0·7	S.	....	·05	......	93	P
	74·5	75·0	79	74	4·2	SW.	28·58	·04	......	79	P
11.	70·5	70·5	71	......	1·9	S.	....	·06	......	86	P
	72·0	73·0	78	75	4·8	S.	28·43	·03	......	73	R
12	71·0	70·5	69	......	1·7	S.	....	·02	......	86	P
	72·5	73·5	84	76	4·4	SW.	28·42	·04	......	68	P
13	70·5	70·5	68	......	2·1	S.	....	·03	......	95	P
	......	......	......	76	3·2	W.	28·44	......	......	......	......
14.	71·0	71·0	67	......	1·7	SW.	....	·06	......	95	Q
	......	......	......	75	4·4	SW.	28·43	......	......	......	......
15	71·0	71·0	69	......	3·1	S.	....	·07	·02	81	P
	......	......	......	70	....	....	28·45	......	......	......	......
16	70·0	69·0	59	......	4·7	NE.	....	·11	·19	83	S
	......	......	......	58	8·5	E.	28·71	......	......	......	......
17	69·0	68·0	58	......	6·1	S.	....	·13	......	86	R
	71·0	72·0	72	62	3·1	S.	28·83	·05	......	60	P
18	69·5	68·5	60	......	0·6	S.	....	·07	...	86	P
	71·0	72·0	76	64	1·6	S.	28·75	·04	...	40	Q
19	69·5	69·0	56	......	2·0	S.	....	·07	......	......	P
	72·0	71·5	75	67	3·3	S.	28·61	·07	......	48	P
20	70·0	69·5	64	......	2·3	S.	....	·06	...	90	P
	72·0	72·5	76	69	3·5	S.	28·44	·06	......	65	P
21	66·0	64·5	73	......	2·9	N.	....	·04	......	83	R
	73·0	72·0	76	69	1·2	S.	28·41	·05	......	69	P
22	71·0	71·5	68	......	....	....	....	·04	......	67	P
	......	......	......	70	....	....	28·30	......	......	......	......
23	69·5	69·5	62	......	2·3	W.	....	......	·17	89	S
	......	......	......	58	10·7	NW.	28·24	......	......	......	......
24	67·0	66·5	56	......	13·7	N.	....	......	·23	61	R
	68·0	68·0	63	56	5·4	SW.	28·40	·10	....	56	Q
25	......	......	......	......	12·6	N.	....	......	...	...	....
	68·0	67·0	55	52	12·4	N.	28·58	·12	...	59	Q
26	65·0	63·0	48	......	5·9	S.	....	·12	....	87	P
	65·5	64·0	60	52	4·8	SW.	28·68	·12	......	58	Q
27	65·5	64·5	59	......	5·4	S.	....	·07	...	78	P
	67·0	67·5	73	67	5·2	S.	28·45	·06		63	Q
28	......	......	......	......	5·7	W.	....	...		..	...
	65·0	65·0	60	60	16·4	NE.	28·45	·15	·29	67	S
29	63·5	63·0	48	......	7·2	W.	....	·04		80	R
	......	......	......	54	....	....	28·66	..		..	...
30	63·0	61·0	58	......	5·5	S.	....	·14	·07	69	S
	65·0	65·5	70	63	5·6	S.	28·34	·05	..	65	P
31	64·5	64·0	62	......	4·1	SW.	....	·03		84	Q
	65·0	66·0	76	69	5·7	SW.	28·17	·06		96	R

Average time of observation:—7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION, KEEWATIN, ONT., FOR SEPTEMBER, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	63·0	63·0	60		8·3	W.		·01		92	P
	66·5	66·5	72	69	3·3	S.	28·42	·07		69	S
2	64·0	64·0	65		6·3	N.E		·04	·02	82	S
	66·0	66·0	78	72	8·0	S.	28·47	·06		42	Q
3.	65·0	65·0	66		5·5	S.		·03		80	P
	68·0	69·0	72	72	3·1	S.	28·52	·04		73	Q
4	66·5	67·0	66		1·1	S.		·02		90	P
	69·0	69·0	76	71	4·5	S.	28·47	·04		63	P
5.	67·0	67·5	76		3·7	S.		·04		63	P
				74			28·40				
6	67·0	67·0	68		4·4	S.		·02		85	Q
	68·0	69·0	76	73			28·33	·05		67	P
7	66·5	66·5	67		1·9	S.				92	P
	68·5	69·0	73	73	3·1	S.	28·18	·03		63	Q
8					4·1	W.					
	64·0	63·5	56	61	9·7	W.	28·15		·27	88	S
9	63·0	62·0	52		4·7	W.		·03		84	R
	64·5	64·0	64	59	8·3	S.	28·27	·08		60	P
10	63·0	63·0	52		5·7	W.		·06	·35	91	S
	64·0	63·0	55	54	11·8	W.	28·42	·08		71	Q
11	62·0	60·5	43		8·9	W.		·07		78	Q
	61·5	61·0	51	49	4·4	NW.	28·55	·12		45	R
12	62·0	60·0	53		2·2	S.		·06		61	S
				49			28·41				
13	62·0	60·0	46		5·2	N.		·08	·12	89	S
	62·0	62·0	54	52	1·1	NW.	28·26	·03		76	S
14					5·6	W.					
				49	4·9	W.	28·19				
15.	60·0	59·0	48		5·1	S.		·23	·10	93	P
	61·0		60	57	11·3	S.	28·33			56	P
16.	60·5	58·0	54		9·8	W.				91	S
	59·5	60·0	57	56	6·8	N.	28·45	·07		61	R
17	60·0	59·5	51		3·5	S.		·06		82	Q
	62·0	62·0	66	58	7·3	S.	28·46	·05		76	Q
18	60·0	59·0	52		5·6	NW.		·00	·36	94	S
	59·5	58·5	52	52	11·8	W.	28·50	·05		69	R
19	59·0	58·0	51		4·5	S.		·04		87	S
				49			28·25				
20					15·1	N.					
	58·0	59·5	54	48	19·5	NW.	28·27		·12	67	Q
21	58·0	57·0	43		4·6	NW.					Q
	57·0	57·5	55	53	7·0	W.	28·50	·05		55	P
22	58·0	57·0	53		2·9	S.		·03		73	Q
	58·5	59·0	64	58	7·6	S.	28·33	·05		20	R
23	58·0	58·0	49		3·1	W.		·00		87	P
				55	10·6	N.	28·42				
24	57·0	55·0	40		7·9	E.		·13		84	R
	56·0	55·0	46	45	8·0	E.	28·68	·06		72	S
25	56·5	55·0	47		8·3	N.		·00	·84	93	S
				45	7·8	N.	28·34	·00			
26	55·0	54·0	44					·00	·31	93	Q
				42			28·73	·00			
27	54·0	54·5	38		10·3	E.		·10		94	R
				43	11·8	SE.	28·63				
28.	54·0	53·0	44		12·5	SE.		·14		85	R
	54·0	53·0	50	48	10·7	SE.	28·64	·03		74	R
29.	54·0	53·0	47		7·2	SE.		·06	·30	89	S
	53·5	53·0	49	49	7·9	SE.	28·62	·00	·04	87	S
30	53·5	52·5	47		4·3	S.		·05	·08	86	S
	53·5	53·0	49	49	6·3	S.	28·50	·00	·08	87	S

Average time of observation:—7.15 a.m. and 6.30 p.m.
P=Clear, no clouds.
Q=Small fleecy clouds.
R=Cumuli.
S=Heavy, overcast, threatening.

METEOROLOGICAL DATA FOR M.H.S. STATION, KEEWATIN, ONT., FOR OCTOBER, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	53·5	53·0	49		3·4	S.		·03	·05	87	S
	54·5	55·0	56	53	6·6	SE.	28·27	·02		82	P
2	54·5	54·5	56		5·5	S.		·02	·04	88	P
	54·5	53·0	54	57	6·2	NW.	28·06	·03		76	R
3	54·5	53·0	54		7·3	N.		·03		59	Q
				49			28·31				
4	53·0	51·0	38		12·2	N.		·06		83	Q
	52·0	50·0	39	40	13·1	N.	28·47	·04		68	Q
5	52·0	51·0	42		4·4	S.		·04		85	S
	52·0	51·5	47	43	6·2	S.	28·32	·01	·19	86	S
6	52·0	50·5	42		7·2	N.		·00	·13	88	S
	50·0	49·0	35	41	20·4	N.	28·28	·00		86	S
7					19·6	N.					
	44·0	46·0	32	34	17·6	N.	28·48	·05	·05		S
8	44·0	46·0	27		14·4	N.		·04		28	P
	48·0	47·0	34	35	6·2	N.	28·84	·06		62	P
9	47·0	46·0	36		8·8	S.		·04		78	Q
				41	13·5	S.	28·45				
10	48·5	49·0	47		5·4	N.				69	P
				44			28·27				
11	47·5	47·5	39		1·8	NW.		·03		37	R
				43			28·42				
12	48·0	47·5	44		3·8	S.		·06		85	P
	49·0	48·5	52	46	6·3	S.	28·29	·03		69	R
13	48·0	48·0	45		2·3	S.		·02		86	S
	49·5	50·0	54	49	0·6	S.	28·30	·01		59	S
14	48·0	48·0	43		4·5	S.		·02		92	P
				51	8·0	S.	28·55				
15	49·0	48·5	52		7·8	S.		·03		88	S
	49·5	49·0	56	55	1·3	S.	28·63	·02		71	P
16	47·0	46·5	38		2·1	S.		·01			Fog
	50·0	55·5	53	50	2·0	S.	28·71	·02		58	R
17	50·5	53·0	59		0·5	S.		·00		73	P
				51			28·47				
18	49·0	48·5	42		1·6	S.		·01			P
	50·0	51·0	58	51	3·0	S.	28·35	·02		67	Q
19	49·5	49·5	52		2·8	S.		·01		81	Q
				52	8·1	W.	28·12				
20	47·0	46·0	32		9·4	W.		·06	·05	81	P
	47·0	46·5	45	42	7·5	S.	28·29	·05		93	R
21	47·0	46·5	32		4·6	W.		·02		91	P
	47·5	47·5	47	41	8·4	NW.	28·53	·02		96	Q
22	47·0	45·0	30		5·0	E.		·04			P
	47·0	46·0	46	44	7·4	E.	28·66	·03		59	P
23	47·0	45·5	30		8·0	E.		·04		90	P
				42	8·4	E.	28·68				
24	47·0	46·0	46		10·6	S.		·15		72	R
				45			28·26	·00			
25	46·0	46·0	40		11·6	S.			·24	96	
				40	12·8	W.	27·81				S
26	45·5	44·5	33		13·3	W.		·00	·21	90	R
	46·0	45·0	36	36	10·0	N.	28·32	·01	·01	91	S
27	45·0	44·5	39		4·6	S.		·04		96	R
	46·0	46·0	52	48	12·1	SW.	28·23	·00		96	P
28	45·0	44·5	39		12·1	N.		·00	·01	81	S
	45·0	45·0	40	43	9·9	N.	28·32	·01		68	Q
29	45·5	45·0	44		4·8	W.		·03		93	P
	45·5	46·0	53	46	8·9	W.	28·37	·03		50	P
30	45·0	44·0	30		2·9	S.		·03		95	R
	45·5	45·0	49	44	8·6	SE.	28·28	·03		55	P
31					10·0	W.					
				46			27·89				

Average time of observation: 7.15 a.m. and 6.30 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening

METEOROLOGICAL DATA FOR M.H.S. STATION, KEEWATIN, ONT., FOR NOVEMBER, 1915.

Day	Temperature				Velocity Wind	Direc-Wind tion	Baro-meter	Evapor-ation	Rain	Humi-dity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	44·5	43·5	32	......	10·0	N.	....	·11		.....	S
	......	......	......	35	15·5	W.	28·05	.....		....	
2	43·0	42·0	29..	....	12·3	NW	......	·07		....	S
	44·0	43·5	40	36	6·6	NW.	28·58	·06		57	R
3	44·0	43·0	38	......	1·4	S.	....	·02		83	P
	43·5	43·0	41	40	7·7	SE.	28·56	·02		65	S
4	43·0	42·5	37	......	5·4	N.	....	·02		83	S
	44·0	43·5	39	39	2·8	S.	28·41	·02		76	R
5	43·0	42·5	36	......	7·2	S.	....	·02		91	S
	43·5	43·0	45	42	10·1	S.	28·31	....		65	S
6	......	......	......	......	5·3	W.	....	....		.....	......
	43·0	44·5	47	43	3·9	N.	28·41	·02		47	Q
7	43·0	44·0	38	......	3·0	E.	....	·02		83	S
	......	......	......	38	....	....	....	....	......	.....	......
8	41·5	40·5	34	......	13·1	W.	....	·00	1·43	95	S
	......	......	......	36	24·4	NW.	28·12	....	......	......	....
9	41·5	40·5	30	......	11·7	NW.	....	·02	·02	......	P
	41·5	41·0	34	34	2·5	SE.	28·76	·01	......	81	S
10	......	......	......	......	15·9	S.	....	·01	·06	......	......
	41·5	40·5	39	40	17·5	SE.	28·17	....	......	88	S
11	42·0	40·5	34	......	6·3	N.W	....	·03	·16	86	S
	40·5	37·5	29	33	16·4	SW.	27·89	·01	·02	78	S
12	......	......	......	......	17·1	W.	....	....	......	......	......
	37·0	......	23	23	16·0	W.	28·18	....	......	87	S
13	38·5	......	20	......	11·3	W.	....	....	......		R
	38·0	......	19	21	9·4	W.	28·44	....			S
14	38·0	......	20	......	6·3	W.	....				P
	......	......	......	20	....	....	28·42	....			......
15	37·0	......	16	......	4·3	N.	....	....	......	83	S
	37·0	......	18	19	2·4	N.	28·39	....	......	84	Q
16	37·0	......	19	......	3·6	E.	....	....		85	Q
	37·0	......	21	21	3·6	S.	28·41	....		78	P
17	36·5	......	29	......	8·1	S.	....	....		83	Q
	36·5	......	33	32	8·1	S.	28·47	....		71	P
18	36·5	......	33	......	3·4	S.	....	....		80	Q
	36·0	......	34	35	2·8	SE.	28·20	....		72	Q
19	36·5	......	32	......	8·1	NW.	....	....		95	Q
	36·5		29	32	13·1	NW.	28·08	....		83	Q
20	35·0		23	......	7·6	N.	....	....		93	Q
	36·0		18	23	9·4	N.	28·03		·10	84	P
21	34·0		16	......	13·1	N.	....	....			R
	.....		......	17	....	....	28·42	....			
22	34·5		15	......	5·7	S.	....	....		82	Q
	34·0		20	18	4·9	E.	28·26	....		92	S
23	33·5		21	......	3·1	SE.	......	....	·15		Q
	34·0		27	26	3·0	S.	28·15	....			P
24	34·0		32	......	6·4	S.	......			95	Q
	34·5		35	34	1·6	N.	27·99			86	R
25	34·5		26	......	7·6	N.	......				R
	34·5		28	29	7·5	N.	28·27				R
26	34·0		25	......	2·2	E.	......				Fog
	34·0		29	29	3·2	SE.	28·17				R
27	34·5		28	......	3·2	N.	......				Q
	34·5		30	30	1·4	N.	28·21			95	R
28	33·5		18	......	8·0	W.	......				Q
	.....		......	21	....	....	28·36				
29	33·5		19	......	7·6	W.	......				R
	33·5		19	19	13·7	NW.	28·37				S
30	.....		11	......	5·8	W.	......				Q
	33·0		16	15	0·8	NW.	28·37				P

Average time of observation:—7.45 a.m. and 5.00 p.m.
P = Clear, no clouds.
Q = Small fleecy clouds.
R = Cumuli.
S = Heavy, overcast, threatening.

METEOROLOGICAL DATA, FOR M.H.S. STATION, KEEWATIN, ONT., FOR DECEMBER, 1915.

Day	Temperature				Velocity Wind	Direction Wind	Barometer	Evaporation	Rain	Humidity	General
	Lake	Tank	Air	Day							
	°	°	°	°	Miles per hour		Inches	Inches	Inches	%	
1	33·0		7		7·0	N.					Q
	32·5		9	10	3·6	NW.	28·59				P
2	33·0		17		3·4	S.					Q
	33·0		25	21	5·4	E.	28·38				R
3	33·0		18		3·4	E.					P
	33·0		27	26	4·8	SE.	28·61				S
4	33·5		28		8·9	SE.				94	R
	33·0		30	29	7·0	SE.	28·58			84	R
5	34·0		32		7·9	S.				90	S
				31			28·71				
6	33·5		28		8·9	S.				94	P
			32	32	10·6	S.	28·54				S
7	33·5		33		7·1	W.				90	S
	33·5		30	33	11·6	NW.	28·19		·30		S
8	33·0		25		12·5	N.				94	S
	33·0		24	27	5·8	N.	28·46				S
9	33·0		15		3·6	E.					S
			13	18	4·0	E.	28·56				P
10	33·0		7		5·2	SE.					S
	33·0		18	16	9·5	SE.	28·57		·05		S
11	33·0		19		7·4	S.					S
	33·0		15	20	6·1	W.	28·42				S
12					1·7	W.					
			15	10			28·45				P
13	33·0		− 1		6·5	W.					Q
	33·0		2	2	8·1	N.W.	28·68				P
14	33·0		− 8		2·6	SE.					Q
			3	0	1·3	SE.	28·64				P
15			5		5·8	S.					Q
			20	13	9·5	SE.	28·50				R
16	33·0		22		9·1	SE.					S
			23	24	1·8	S.	28·31		·40		S
17			10		4·9	N.					S
			8	13	6·1	N.	28·20				P
18	33·0		5		4·6	N.					S
			6	8	4·5	N.	28·30				Q
19			1		1·1	N.					P
				3			28·46				
20			− 2		2·0	S.					Q
			11	9	4·0	S.	28·43				S
21			14		2·4	S.					S
			13	15	3·8	SE.	28·30				P
22			16		7·2	SE.					S
			22	20	4·4	N.	28·04				S
23	33·5		20		5·1	NW.					S
			22	23	5·0	N.	28·27		·05		S
24	33·5		17								S
			22	24	2·7	NW.	28·48				S
25			17								S
				20			28·22				S
26			19		7·1	N.					S
				15			28·22		·05		
27	33·0		−17		6·0	W.					Q
			− 1	− 3	2·8	S.	28·48				P
28			4		4·9	SE.					S
			14	8	10·4	E.	28·17				Q
29	33·0		13		7·8	NE.					Q
			13	14	5·9	N.	28·43		·20		P
30			− 2		3·1	W.					Fog
			2	2	1·4	SE	28·71				Q
31	33·0		16		3·8	E.					S
			18	16	6·1	S.	28·36		·08		S

Average time of observation:—7.45 a.m. and 5.00 p.m.
P =Clear, no clouds.
Q =Small fleecy clouds.
R =Cumuli
S =Heavy, overcast, threatening.

Daily Gauge Heights at Kenora Power House and Keewatin River Bridge from August 1, 1912, to February 19, 1913.

The Observations during the above period were made by members of the Manitoba Hydrometric Survey.

Daily Gauge Height, in Feet, of East and West Branch Winnipeg River for August, September, October and November, 1912.

Day	August					October				
	Kenora Power House.			Keewatin River Bridge.		Kenora Power House.			Keewatin River Bridge.	
	Hour.	Tailrace.	River.	Hour.	Gauge.	Hour.	Tailrace.	River.	Hour.	Gauge.
	a.m.			a.m.		a.m.			a.m.	
1	8 00	1,036 23	1,035 07	7 30	1,032 74	8 30	1,035·55	1,034 08	7 30	1,033 42
2	8 00	1,036 24	1 035 08	7 30	1,032 74	8 30	1,035 47	1,033 98	7 30	1,033 46
3	8 00	1,036 26	1,035 09	7 30	1,032 76	8 30	1,035·49	1,033 98	7 30	1,033 49
4	8 00	1,035 27	1,034 19	7 30	1,032 62	9 00	1,035·47	1,033 99	7 30	1,033·54
5	8 00	1,036 18	1,033 67	7 30	1,032 39	8 30	1,036 27	1,035 37	7 30	1,034·32
6	8 00	1,036 27	1,035 18	7 30	1,032 62	8 30	1,035 12	1,034 55	7 30	1,034 49
7	8 00	1,036 24	1,035 15	7 30	1,032 79	8 30	1,036 27	1,034 67	7 30	1,034 49
8	8 00	1,036 25	1,035 16	7 30	1,032 84	8 30	1,036 31	1,035 57	7 30	1,034 84
9	8 00	1,036 25	1,035 16	7 30	1,032 86	8 30	1,036 37	1,035 67	7 30	1,034 89
10.	8 00	1,036 25	1,035 17	7·30	1,032·87	8·30	1,036 37	1,035 67	7 30	1,034 99
11.	8 00	1,035 24	1,034 15	7·30	1,032 79	9 00	1,036 36	1,035 65	7 30	1,035 12
12	8 30	1,036 18	1,034·15	7 30	1,032 54	8 30	1,036 32	1,035 63	7 30	1,035 19
13	8 30	1,036·20	1,035 16	7·30	1,032 79	8·30	1,035 47	1,034 99	7 30	1,035 12
14	8 30	1,036·22	1,035 18	7 30	1,032 86	8 30	1,036 29	1,035 25	7 30	1,034 94
15	8 30	1,036·27	1,035·19	7·30	1,032 94	8·30	1,036 37	1,035 65	7 30	1,035 19
16	8·30	1,036 28	1,035 18	7·30	1,032 96	8 30	1,036 37	1,035 69	7 30	1,035 32
17	8·30	1,036 25	1,035 18	7 30	1,032 96	8 30	1,036 37	1,035 71	7 30	1,035·36
18.	8 30	1,035 28	1,034 27	7 30	1,032 89	8 30	1,036 38	1,035 86	7 30	1,035 69
19.	8 30	1,036 17	1,034 18	7 30	1,032 64	8 30	1,036 43	1,035 95	7 30	1,035 82
20	8 30	1,036 19	1,034·97	7 30	1,033 34	8 30	1,035 67	1,035 41	7 30	1,035 77
21.	8 30	1,036 27	1,035 21	7 30	1,033·64	9·00	1,035 78	1,035 39	7 30	1,035 57
22	8 30	1,036·29	1,035 27	7 30	1,032 96	8 30	1,036 43	1,035 96	7 30	1,035 84
23	8 30	1,036 27	1,035 22	7 30	1,033 02	8 30	1,036 47	1,035 97	7 30	1,035 89
24	8 30	1,036 27	1,035 25	7 30	1,033 06	9·00	1,036 47	1,036·01	7 30	1,035 97
25	8 30	1,035 36	1,034·27	7 30	1,032 96	8 30	1,036 47	1,035·99	7 30	1,035 92
26	9 15	1,036·17	1,034 19	7 30	1,032 74	8·30	1,036·46	1,035 99	7 30	1,035 91
27	8 30	1,035 77	1,034 96	7 30	1,032 94	9 00	1,035·67	1,035 49	7 30	1,035 89
28	8 30	1,036 20	1,034·38	7·30	1,032 96	8·30	1,035·90	1,035 46	7 30	1,035 62
29	8 30	1,036 27	1,035 27	7·30	1,033 02	8 30	1,036·41	1,036·05	7 30	1,035 84
30	9 30	1,036 18	1,034 77	7 30	1,033·06	8 30	1,036 47	1,036 03	7·30	1,035 89
31	8 30	1,036 27	1,034 65	7 30	1,033 09	8 30	1,036 47	1,036 07	7 30	1,036 01
	September					November				
1	8 30	1,035·27	1,033·75	7·30	1,032 99	9·00	1,036·48	1,036·08	7 30	1,035·98
2	8·30	1,036·15	1,034·37	7·30	1,032·76	8 30	1,036·47	1,036·07	7 30	1,035·97
3	8 30	1,036 35	1,035 29	7 30	1,032 96	8·30	1,035·79	1,035·59	7 30	1,035·89
4	8 30	1,036 27	1,034 90	7 30	1,033 09	8·30	1,035 94	1,035·59	7 30	1,035 69
5	8·30	1,036 26	1,035·14	7 30	1,033·16	8 30	1,036 48	1,036 03	7 30	1,036·01
6	8·30	1,035·47	1,034 07	7 30	1,033 14	8 30	1,036·48	1,036 07	7 30	1,036·94
7	8·30	1,035 47	1,033 72	7·30	1,033·14	8 30	1,036 48	1,036·07	7 30	1,036 89
8	8·30	1,035·28	1,034·27	7·30	1,033 02	9 00	1,036 45	1,035 92	7 30	1,036·34
9	8·30	1,035 47	1,033 97	7 30	1,032 84	9·00	1,036 35	1,035·74	7 30	1,036 19
10	8 30	1,035 77	1,033 87	7 30	1,033 02	9 00	1,035 53	1,034 98	7 30	1,036 06
11	8 30	1,035 17	1,033 77	7 30	1,033 09	8 30	1,035 67	1,034 87	7 30	1,034 66
12	8·30	1,035 27	1,033 77	7 30	1,033 09	8·30	1,036 36	1,035 62	7 30	1,034·84
13	9 00	1,036 17	1,034 67	7 30	1,033 16	8·30	1,036 45	1,035 80	7 30	1,035 46
14	8 30	1,036 27	1,034 65	7 30	1,033 24	8 30	1,036 46	1,035 88	7 30	1,035 66
15	8 30	1,035 27	1,033 84	7 30	1,033 22	8 30	1,036 44	1,035 91	7 30	1,035 72
16	8 30	1,036 33	1,034 49	7 30	1,033 02	8 30	1,036 49	1,036 01	7 30	1,035 76
17	8 30	1,036 32	1,034 49	7 30	1,033 16	8 30	1,035 68	1,035 15	7·30	1,035 69
18	8 30	1,035 58	1,033 95	7 30	1,033 20	9 00	1,035 77	1,035 37	7 30	1,035·64
19	8 30	1,035 57	1,033 96	7 30	1,033 22	9 00	1,036·46	1,035 95	7·30	1,035·72
20	8 30	1,035 59	1,033 97	7 30	1,033 22	9.00	1,036 39	1,035 95	7 30	1,035·74
21	8 30	1,035·47	1,033 97	7 30	1,033 26	9 00	1,036 48	1,035 99	7 30	1,035 79
22	8 30	1,035 31	1,033·79	7 30	1,033 19	9 00	1,036 48	1,035 99	7 30	1,035 88
23	8 30	1,035 57	1,033 95	7 30	1,033 04	9 00	1,036 57	1,036 12	7 30	1,035 96
24	8 30	1,035 67	1,034 17	7 30	1,033 16	9 00	1,035 85	1,035 59	7 30	1,035·86
25	8 30	1,035 49	1,034 16	7 30	1,033 24	8 30	1,035 99	1,035 56	7 30	1,034 86
26	8 30	1,035 58	1,034 16	7 30	1,033 29	9 00	1,036 49	1,036 10	7 30	1,035 94
27	8 30	1,035 60	1 034 18	7 30	1,033·37	9 00	1,036 59	1,036 12	7 30	1,035 98
28	8 30	1,035 59	1,034 17	7 30	1,033·42	9 00	1,036·49	1,036 08	7·30	1,036·16
29	8·30	1,035 34	1,033 88	7 30	1,033·36	9 00	1,036 52	1,036 22	7 30	1,036 16
30	8 30	1,035·59	1,034 07	7·30	1,033·26	9 00	1,036 55	1,036 08	7 30	1,036 14
31	....									

Gauge heights reduced to W.P.S. Datum.

Daily Gauge Height, in Feet, of East and West Branch Winnipeg River for December, 1912, January and February, 1913.

	December, 1912.					January, 1913				
Day	Kenora Power House.			Keewatin River Bridge.		Kenora Power House.			Keewatin River Bridge.	
	Hour.	Tailrace.	River.	Hour.	Gauge.	Hour.	Tailrace.	River.	Hour.	Gauge.
	a.m.			a.m.		a.m.				
1.	9·00	1,035 87	1,035·70	7·30	1,035 96	9·00	1,036·58	1,036·02		
2	9·00	1,035·97	1,035·57	7·30	1,034 94	9·00	1,036·60	1,035·99		
3	9·00	1,036 52	1,036·09	7 30	1,035 94	9·00	1,036·60	1,035·94		
4.	9·00	1,036·58	1,036·13			9·00	1,036 64	1,036 12	9 00	1,036 01
5.	9·00	1,036 57	1,036 15			9·00	1,036·04	1,035 73		
6.	9·00	1,036·61	1,036 15			9·00	1,036·17	1,035·60		
7.	9·00	1,036·62	1,036·16	9 00	1,036 01	9·00	1,036 67	1,036·03		
8.	9 00	1,036 07	1,035·79			9·00	1,036·67	1,036·05		
9.	9·00	1,036·16	1,035 75			9 00	1,036·65	1,035·99		
10.	9 00	1,036·64	1,036·19			9·00	1,036·66	1,036·06		
11.	9·00	1,036·68	1,036·22			9 00	1,036·64	1,036·01	10 00	1,035 86
12.	9·00	1,036 65	1,036·19			9 00	1,036·06	1,035·62		
13.	9·00	1,036·64	1,036·19			9 00	1,036·17	1,035·65		
14.	9·00	1,036·52	1,036·09	9 30	1,035 98	9 00	1,036·62	1,036 06		
15	9 00	1,035·47	1,035·47			9·00	1,036·72	1,036 03		
16.	9·00	1,036 13	1,035 69			9 00	1,036·72	1,036 15		
17	9·00	1,036·55	1,036·11			9 00	1,036·78	1,036 19		
18	9·00	1,036 62	1,036 15			9·00	1,036·78	1,036 20	10 00	1,035 86
19	9·00	1,036·67	1,036·29			9·00	1,036·19	1,035 84		
20.	9·00	1,036·69	1,036·29			9 00	1,036·39	1,035 84		
21.	9·00	1,036·70	1,036·32	9 00	1,035·96	9 00	1,036·72	1,036 14		
22.	9·00	1,036 07	1,035·89			9·00	1,036·80	1,036 19		
23.	9·00	1,036·31	1,035 95			9·00	1,036 77	1,036 21		
24	9·00	1,036·57	1,036·17			9·00	1,036 82	1,036·27		
25.	9·00	1,035·87	1,035·57			9·00	1,036 77	1,036·18	10 00	1,035 91
26.	9·00	1,036·37	1,035·97			9·00	1,036 20	1,035·87		
27	9 00	1,036·42	1,035 97			9 00	1,036 20	1,035·60		
28.	9·00	1,036·53	1,036·09	9·00	1,035·98	9·00	1,036 69	1,036 15		
29	9·00	1,035·99	1,035·69			9 00	1,036·71	1,036 10		
30	9·00	1,036·09	1,035·63			9·00	1,036·17	1,035·84		
31	9·00	1,036·54	1,036·04			9·00	1,036 69	1,036 19		

February, 1913.

Day.	Kenora Power House.			Keewatin River Bridge	
	Hour.	Tailrace.	River	Hour.	Gauge
	a.m.			a m.	
1	9 00	1,036 72	1,036 17	10 00	1,035 94
2	9 00	1,036 17	1,035 81		
3	9 00	1,036 39	1,035 86		
4	9 00	1,036 70	1,036 15		
5	9 00	1,036 69	1,036 18		
6.	9 00	1,036 72	1,036 15		
7	9 00	1,036·59	1,036 11		
8	9 00	1,036 51	1,036 02	10 00	1,035 76
9.	9 00	1,036 01	1,035 69		
10	9 00	1,036 03	1,035 62		
11	9 00	1,036 51	1,036 09		
12	9 00	1,036 56	1,036 15		
13	9 00	1,036 55	1,036 15		
14	9 00	1,036 19	1,036 16		
15	9 00	1,036 59	1,036 14	10 00	1,036 28
16.	9 00	1,035 97	1,035 25		
17.	9 00	1,036 01	1,035 05		
18	9 00	1,036 47	1,035 86		
19	9 00	1,036 18	1,035 41		

Gauge heights reduced to W P S Datum

Taken by S. C. O'Grady.

English River—Oak Falls—Pitch from Below—Looking Upstream.

Taken by S. C. O'Grady.

English River—Ear Falls—Crest of Second Pitch from Below.

Daily Gauge Height, Winnipeg River, at Eastern Outlet, from October 14, 1905, to May 18, 1906.

Obtained from the Ontario Hydro-Electric Commission.

DAILY GAUGE HEIGHT, IN FEET, OF WINNIPEG RIVER AT EASTERN OUTLET, FOR 1905 AND 1906.

	1905.			1906.								
Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1		604·1	604·3	604·35	604·25	604·0	603·55	604·05				
2		604·3	604·3	604·35	604·25	604·0	603·5	604·14				
3		604·1	604·3	604·35	604·25	603·9	603·5	604·15				
4		604·3	604·4	604·35	604·20	603·95	603·5	604·1				
5		604·2	604·3	604·35	604·20	603·9	603·5	604·1				
6		604·2	604·35	604·35	604·20	603·9	603·45	604·05				
7		604·1	604·4	604.35	604.20	603·9	603·45	604·05				
8		604·2	604·3	604·35	604·20	603·85	603·45	604·0				
9		604·3	604·4	604·35	604·15	603·85	603·45	603·95				
10		604·3	604·4	604·3	604·15	603·85	603·45	604·05				
11		604·2	604·4	604·3	604·15	603 85	603·45	603·8				
12		604·2	604·4	604·3	604·15	603·8	603·45	603·8				
13		603·9	604·4	604·3	604·15	603·8	603·5	603·85				
14	604·2	604·3	604·4	604·3	604·15	603·8	603·55	603·8				
15	604·2	604·2	604·4	604·3	604·15	603·8	603·6	603·8				
16	604·2	604·3	604·4	604·25	604·15	603·8	603·65	603·8				
17	604·0	604·2	604·4	604·25	604·1	603·8	603·65	603·75				
18	604·1	604·2	604·4	604·25	604·1	603·8	603·75	603·75	Readin	g discont	inued	
19	604·1	604·3	604·4	604·25	604·1	603·75	603·8					
20	604·1	604·3	604·35	604·25	604·1	603·75	603·85					
21	604·2	604·4	604·35	604·25	604·05	603·75	604·0					
22	604·3	604·3	604·35	604·25	604·05	603·7	603·9					
23	603·9	604·2	604·35	604·25	604·05	603·65	604·05					
24	604·1	603·9	604·4	604·25	604·05	603·65	604·05					
25	604·35	604·3	604·4	604·25	604·05	603·65	604·05					
26	604·2	604·3	604·4	604·25	604·05	603·6	604·05					
27	604·0	604·2	604·35	604·25	604·05	603·6	604·1					
28	604·2	603·9	604·35	604·25	604·0	603·6	604·1					
29	604·3	604·2	604·35	604·25		603·55	604·15					
30	604·2	604·3	604·35	604·25		603·55	604·0					
31	604·3		604·35	604·25		603·55						

Gauge Readings obtained from the Ont. Hydro.-Electric Commission.

Taken by S. C. O'Grady

ENGLISH RIVER—VIEW UPSTREAM FROM THIRD PITCH AT MANITOU MIDDLE.

Estimated Daily Discharge, Mill "A", Lake of the Woods Milling Co., Keewatin. From May, 1913, to December, 1915.

ESTIMATED DAILY DISCHARGE IN FEET PER SEC. OF MILL "A," LAKE OF THE WOODS MILLING CO., KEEWATIN, FOR 1913-14.

1913.

Day	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.					840	290	280			885	547	669
2					840	600	575			905	224	823
3					840	850	845			895	750	798
4.					290	850	850			895	740	803
5.					500	850	850			....	770	800
6					840	850	280			507	750	819
7.					840	850	570			912	800	230
8					810	290	850			897	750	530
9					840	605	850			907	224	790
10.					840	850	850		795	900	850	812
11..					290	855	850		796	900	800	768
12.					550	855	850		837	.....	760	783
13.					850	855	280		841	518	760	805
14.					860	855	570		.....	890	760	226
15					860	290	850		833	882	800	537
16					860	605	850		862	882	227	825
17.					850	855	850		844	897	750	810
18.					290	855	850		770	897	750	825
19.					560	855	850		853	....	760	835
20					850	850	280		881	....	740	787
21					850	855	570		.....	557	800	222
22.					850	290	850		702	890	750	566
23					850	230	850		730	897	224	816
24					290	500	850		725	897	750	805
25.					100	870	850		704	882	760	226
26					570	890	850		718	......	770	805
27					860	890	280		781	557	700	780
28.					850	870	570		.....	897	730	220
29					850	290	850		200	908	800	562
30					850	610	850		715	897	229	836
31.					850	......	850		..	890	.....	836

1914.

1.	795	6	6	840	795	178	63	946	863	886	43	821
2.	800	875	860	843	799	840	185	45	847	776	196	848
3.	822	805	856	843	75	980	209	804	847	785	196	846
4	6	870	828	784	834	860	209	814	851	43	222	831
5	720	875	821	105	839	920	626	825	842	836	202	846
6	838	805	862	941	859	925	790	826	784	841	214	117
7	870	835	803	883	855	9	805	804	858	819	211	209
8	868	6	6	823	841	905	842	823	885	825	3	210
9	862	870	837	297	831	838	772	39	849	830	751	206
10	859	875	840	256	75	890	772	893	856	882	742	204
11	6	870	860	264	884	928	775	899	847	3	832	206
12	717	907	863	66	865	858	51	809	853	8	857	206
13	772	920	868	249	890	847	766	974	40	817	843	108
14	826	825	882	867	886	18	770	968	914	832	843	824
15	807	6	6	873	845	202	782	927	919	801	42	826
16	880	870	864	842	865	845	778	55	868	825	802	820
17	821	875	862	850	75	850	768	947	929	797	805	819
18	6	875	878	826	822	912	806	953	936	9	800	778
19	702	880	878	66	828	988	629	965	937	142	805	851
20	845	885	890	852	835	985	803	958	33	827	876	121
21	762	875	860	850	802	201	793	923	938	742	848	851
22.	165	6	6	865	876	1,000	787	969	923	760	59	860
23	180	885	860	850	934	962	769	52	907	764	856	172
24	160	885	872	838	52	910	769	987	878	765	854	839
25	6	895	882	857	873	1,000	347	966	915	3	795	127
26	695	905	892	66	880	1,000	13	963	898	798	795	834
27.	853	920	886	229	849	975	749	886	43	740	858	73
28	868	880	874	844	875	18	770	931	811	817	859	841
29	875		6	878	892	192	772	899	896	793	100	850
30	890		861	772	890	938	780	814	833	820	818	856
31	881		828		52	..	808	836		800		872

Estimated Daily Discharge, in Feet per Sec. of Mill "A," Lake of the Woods Milling Co., Keewatin, for 1915.

Day.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	109	804	810	808	824	783	141	90	645	836	874	943
2	859	802	817	803	102	787	254	238	717	837	884	908
3	113	796	779	713	766	790	201	235	689	94	887	902
4	714	799	775	109	794	766	144	237	723	869	893	910
5	763	765	794	205	803	398	293	240	77	804	888	91
6	823	778	796	213	790	89	292	250	618	875	868	904
7	798	106	108	219	805	711	301	228	729	857	806	909
8	780	833	775	221	792	813	312	93	738	844	906	988
9	813	837	785	759	102	831	302	245	749	852	908	884
10	113	876	788	799	714	797	316	241	730	300	884	926
11	781	839	245	108	779	833	141	236	729	870	905	918
12	853	845	186	751	810	834	263	240	70	864	921	857
13	841	870	218	817	807	66	250	253	645	840	896	962
14	798	111	97	796	767	718	255	244	738	844	827	939
15	810	859	183	785	801	842	256	93	740	861	915	929
16	816	870	191	795	89	837	254	241	796	868	936	930
17	105	871	182	788	57	851	253	222	735	337	927	935
18	756	845	186	109	10	815	96	231	734	898	934	908
19	842	844	224	752	10	509	247	220	91	887	935	840
20	824	881	203	835	150	82	257	214	854	877	901	910
21	852	88	112	813	153	162	238	208	813	865	843	878
22	806	884	678	832	167	162	244	92	810	896	933	908
23	844	887	718	797	53	57	257	219	824	876	943	930
24	99	893	806	921	168	10	233	136	821	796	903	932
25	755	896	833	103	161	10	93	133	833	874	941	97
26	810	871	839	833	170	177	233	126	91	888	984	553
27	866	936	821	816	177	137	236	145	831	880	931	888
28	838	85	121	933	174	297	234	198	846	901	856	938
29	861	....	690	854	196	309	234	94	867	927	948	923
30	808	....	780	887	17	316	235	224	862	912	937	892
31	124	....	830	....	796	....	218	225	....	777	....	898

Estimated Daily Discharge in Feet per Sec. of Mill "C," Lake of the Woods Milling Co., Keewatin, for 1913.

1					700	205	210			650	650	450
2					700	505	515			650	95	730
3					700	715	725			650	360	735
4					200	715	730			650	685	730
5					510	715	730				655	725
6					710	715	210			680	685	695
7					710	715	515			650	720	90
8					710	205	725			735	685	445
9					710	505	725			685	95	712
10					710	725	725			630	300	670
11					200	730	725			665	650	680
12						730	735			90	650	700
13						730	215			410	685	695
14						730	520			725	685	100
15						215	735			690	610	165
16						520	735			680	95	700
17						725	735			685	130	725
18						725	735			216	712	715
19						725	735			396	720	710
20						725	215			680	680	705
21						725	520			680	720	150
22						210	725			680	725	180
23						510	735			650	95	650
24						715	735			685	355	700
25						715	735			650	730	150
26						725	730			232	740	700
27						725	215			318	660	730
28						725	510			735	735	200
29						210	735			680	705	190
30						505	735			680	100	740
31							735			685		710

ESTIMATED DAILY DISCHARGE, IN FEET PER SEC. OF MILL "C," LAKE OF THE WOODS MILLING CO., KEEWATIN, FOR 1914-15.

1914.

Day.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	680	250	120	675	634	670	91	690	710	700	210	700
2	710	700	640	685	627	670	660	195	740	745	665	720
3	700	720	646	670	147	660	660	655	700	685	670	690
4	160	730	642	675	627	660	660	650	710	180	680	680
5	560	710	616	235	658	660	655	665	720	185	675	685
6	680	100	634	680	645	650	660	700	730	185	650	140
7	670	100	616	695	658	175	665	695	730	185	690	680
8	665	360	237	685	645	675	635	700	720	185	....	680
9	680	700	634	675	658	685	625	210	730	185	680	700
10	700	690	646	675	147	670	645	670	690	185	680	690
11	90	690	642	695	611	690	635	680	710	185	675	675
12	570	690	640	235	511	665	76	695	710	185	695	690
13	610	690	640	730	627	685	635	710	80	185	695	260
14	630	680	668	730	627	170	630	695	730	185	695	260
15	640	130	198	645	634	170	645	715	750	185	160	260
16	675	680	695	195	627	660	645	200	720	185	690	190
17	635	700	695	100	147	650	675	710	720	185	660	190
18	100	680	700	100	662	680	660	700	700	185	650	190
19	575	700	722	265	658	675	200	715	700	730	650	190
20	650	690	695	715	652	665	650	665	110	675	660	200
21	700	700	695	615	686	130	655	730	730	675	650	190
22	685	230	240	635	674	665	660	700	720	700	160	190
23	715	690	660	130	686	665	670	80	700	695	705	190
24	720	690	690	140	105	690	655	745	720	700	705	190
25	160	690	702	140	686	680	660	690	720	160	670	190
26	590	690	686	140	670	670	73	700	720	630	660	190
27	710	690	690	140	697	690	655	670	160	630	680	190
28	685	700	670	635	686	155	650	705	730	670	680	190
29	685	......	237	595	680	155	665	675	730	680	160	190
30	690	......	686	600	702	660	645	715	620	650	705	190
31	675	......	695	....	105	....	665	680	....	650	....	190

1915.

1	198	648	652	179	726	5	166	141	635	667	810	829
2	198	707	740	179	205	5	166	611	635	673	761	810
3	212	665	735	223	775	5	166	666	635	86	761	798
4	647	695	707	223	666	5	166	660	660	749	816	755
5	683	689	707	223	737	89	166	643	155	673	755	163
6	695	701	740	223	686	153	169	643	583	705	829	761
7	683	265	217	223	676	209	617	688	629	692	798	755
8	683	689	665	223	705	209	631	141	648	711	768	755
9	695	735	760	219	177	209	614	563	635	679	816	749
10	208	735	740	214	600	209	631	614	635	322	780	749
11	530	735	760	223	686	209	147	643	660	692	835	822
12	695	707	725	700	705	209	581	662	156	692	810	877
13	658	707	740	737	716	209	637	649	594	731	822	816
14	695	187	216	727	737	209	662	654	648	743	835	822
15	689	706	629	731	737	209	643	148	642	718	774	810
16	707	770	725	755	170	209	662	588	642	761	768	774
17	248	740	701	709	721	209	662	656	612	374	810	871
18	680	740	745	178	782	209	177	649	623	743	786	816
19	740	735	735	639	822	209	575	662	160	761	822	841
20	740	740	745	722	740	215	637	643	692	774	780	816
21	740	210	179	755	730	648	637	649	660	761	852	780
22	740	692	179	708	790	670	637	138	648	755	768	792
23	707	740	179	750	179	714	662	141	660	774	786	792
24	217	740	179	750	718	744	631	141	679	692	786	810
25	648	740	179	186	719	744	147	141	692	749	829	194
26	730	755	179	731	770	617	600	144	160	761	798	457
27	740	755	179	718	770	166	643	160	705	718	792	822
28	740	248	194	727	729	564	631	160	660	810	829	798
29	713	.....	678	735	719	615	637	160	673	768	822	810
30	707	....	745	765	159	653	625	160	705	768	841	841
31	220	.....	335	.....	5	....	643	170	......	768	....	780

TABULATED RESULTS OF DISCHARGE MEASUREMENTS AT KENORA POWER HOUSE

No.	Date	Forebay Gauge	Dis-charge	Est. Weir	Net Discharge	Load	Head	Efficiency
1	February 24, 1913	97·67	1,047·8	19·8	1,028·0	1,059	22·89	53·2
2	24	97·65	1,329·7	19·1	1,310·6	1,323	22·74	52·6
3	25	97·65	1,312·0	19·1	1,292·9	1,389	22·58	56·2
4	25	97·65	1,242·1	19·1	1,223·0	1,359	22·58	58·4
5	25	97·65	1,282·0	19·1	1,262·9	1,340	22·58	55·5
6	25	97·65	1,309·0	19·5	1,289·5	1,359	22·65	55·0
7	26	97·66	1,394·5	19·5	1,375·0	1,444	22·50	55·3
8	March 2	97·67	711·3	19·5	691·8	810	23·35	59·4
9	2	97·64	776·7	18·8	757·9	836	23·29	55·9
10	3	97·68	1,393·3	20·2	1,373·1	1,454	22·59	55·4
11	3	97·68	1,463·9	20·2	1,443·7	1,610	22·47	58·6
12	3	97·68	1,506·4	20·2	1,486·2	1,668	22·43	59·1
13	7	97·65	1,259·4	19·1	1,240·3	1,372	22·60	57·8
14	7	97·65	1,312·3	19·1	1,293·2	1,357	22·60	54·8
15	7	97·64	1,236·4	18·7	1,217·7	1,316	22·59	56·5
16	7	97·69	1,253·7	20·6	1,233·1	1,282	22·74	54·0
17	7	97·68	1,242·2	20·2	1,222·0	1,267	22·68	54·0
18	7	97·68	1,200·4	20·2	1,180·2	1,265	22·68	55·8
19	7	97·69	1,255·6	20·5	1,235·1	1 284	22·70	54·0
20	8	97·71	1,249·8	21·3	1,228·5	1,253	22·78	53.0
21	8	97·70	1,204·9	20·9	1,184·0	1,263	22·77	55·3
22	8	97·68	1,239·3	20·2	1,219·1	1,236	22·73	52·8
23	8	97·69	1,223·7	20·6	1,203·1	1,250	22·74	54·0
24	8	97·67	1,249·3	19·8	1,229·5	1,266	22·76	53·5
25	8	97·66	1,266·4	19·5	1,246·9	1,307	22·69	54·5
26	8	97·66	1,262·6	19·5	1,243·1	1,275	22·64	53·5
27	9	97·75	815·6	22·8	792·8	717	23·29	45·8
28	9	97·75	771·5	22·8	748·7	767	23·29	51·9
29	9	97·76	776·6	23·2	753·4	727	23·31	48·9
30	9	97·77	765·4	23·6	741·8	710	23·42	48·2
31	9	97·78	719·0	24·0	695·0	70	23·52	50·8
32	9	97·77	748·8	23·6	725·2	696	23·49	48·2
33	9	97·76	613·0	23·2	589·8	672	23·46	57·2
34	10	97·70	1,454·4	20·9	1,433·5	1,567	22·59	57·2
35	10	97·71	1,538·0	21·3	1,516·7	1,607	22·52	55·5
36	10	97·70	1,468·8	20·9	1,447·9	1,622	22·48	58·8
37	15	97·70	1,441·7	20·9	1,420·8	1,613	22·69	59·2
38	15	97·70	1,541·2	20·9	1,520·3	1,639	22·62	56·2
39	15	97·69	1,439·2	20·5	1,418·7	1,607	22·54	59·4
40	19	97·68	1,303·8	20·2	1,283·6	1,351	22·68	54·7
41	19	97·68	1,270·2	20·2	1,250·0	1,354	22·68	56·3
42	19	97·68	1,279·7	20·2	1,259·5	1,354	22·68	56·1
43	19	97·69	1,202·9	20·6	1,182·3	1,337	22·71	58·8
44	20	97·74	1,265·6	22·4	1,243·2	1,321	22·76	55·1
45	20	97·74	1,318·2	22·4	1,295·8	1,340	22·76	53·6
46	20	97·74	1,317·7	22·4	1,295·3	1,343	22·76	53·8
47	20	97·74	1,269·6	22·4	1,247·2	1,338	22·76	55·6
48	April 4	97·80	693·5	24·7	668·8	520	23·54	39·0
49	4	97·81	729·3	25·1	704·2	536	23·54	38·4
50	4	97·82	754·6	25·5	729·1	549	23·54	37·9
51	4	97·82	712·8	25·5	687·3	519	23·59	37·8
52	4	97·82	643·7	25·5	618·2	428	23·63	34·7
53	4	97·80	687·4	24·7	662·7	496	23·55	37·5
54	4	97·81	702·9	25·1	677·8	501	23·57	37·0
55	5	97·80	657·2	24·7	632·5	547	23·55	43·3
56	5	97·82	671·7	25·5	646·2	519	23·61	40·1
57	5	97·82	666·5	25·5	641·0	552	23·57	43·1
58	5	97·82	710·6	25·5	685·1	529	23·56	38·7
59	5	97·82	691·4	25·5	665·9	527	23·56	39·7
60	5	97·83	618·5	25·9	592·6	391	23·62	33·3
61	5	97·83	668·1	25·9	642·2	505	23·60	39·4
62	5	97·83	562·6	25·9	536·7	527	23·58	49·1
63	5	97·83	719·8	25·5	694·3	525	23·59	37·8
64	5	97·83	620·4	25·9	594·5	527	23·54	44·6
65	5	97·81	709·0	25·1	683·9	506	23·57	37·1
66	24	98·26	1,376·6	44·7	1,331·9	1,176	23·10	45·1
67	24	98·26	1,259·0	44·7	1,214·3	1,204	23·05	50·8

SLOPE GAUGES ON WESTERN OUTLET, LAKE OF THE WOODS.

HISTORY.

In August of 1913, fourteen gauges were set on the western outlet of the Lake of the Woods. These gauges were set for the purpose of obtaining slope data in connection with discharge measurements taken on the western outlet at the Norman traffic bridge.

The upper of these gauges is set to head-lake level, while the lower is set in the tailwater of the Norman dam.

From the time of installation of these gauges, readings have been obtained during the time in which meterings have been taken at the Norman traffic bridge metering station.

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS.

DATE 1913	Discharge in Sec. Feet	GAUGE NUMBER													
		1	2	2A	3	4	5	6	7	8	9	10	11	12	13
August 26....	11,991 13,638	59·27	58·95	58·97	58·97	58·53	58·53	58·77	58·09	58·20	58·32	58·05	57·94	58·02	......
		59·26	58·93	58·95	58·93	58·52	58·51	58·74	58·08	58·18	58·29	58·01	57·92	57·99	......
		59·29	58·98	58·97	58·96	58·52	58·51	58·78	58·11	58·18	58·34	58·02	57·96	57·99	......
" 27....	13,424 13,411	59·39	59·12	59·15	59·08	58·65	58·64	58·98	58·20	58·29	58·41	58·15	58·06	58·08	......
		59·47	59·12	59·16	59·14	58·71	58·69	58·96	58·22	58·33	58·50	58·17	58·08	58·12	......
		59·49	59·14	59·19	59·10	58·69	58·68	58·97	58·27	58·32	58·50	58·20	58·10	58·15	......
" 28....	13,158 13,347	59·28	59·01	58·97	58·96	58·55	58·52	58·79	58·11	58·19	58·28	58·06	57·94	58·01	......
		59·21	58·93	58·95	58·92	58·52	58·51	58·72	58·05	58·11	58·22	58·02	57·92	57·96	......
		59·17	58·88	58·92	58·85	58·43	58·42	58·68	57·98	58·08	58·25	57·97	57·86	57·92	......
" 29....	12,941 13,558	59·27	58·92	58·97	58·93	58·51	58·50	58·75	58·09	58·16	58·25	58·02	57·93	57·98	......
		59·25	58·91	58·93	58·89	58·48	58·47	58·72	58·04	58·15	58·32	58·00	57·91	57·96	......
		59·27	58·94	58·95	58·93	58·51	58·49	58·75	58·05	58·16	58·32	58·02	57·91	58·00	......
" 30....	13,173 13,265	59·38	59·10	59·07	59·06	58·62	58·61	58·87	58·18	58·31	58·42	58·13	57·98	58·08	......
		59·37	59·07	59·04	59·05	58·62	58·61	58·85	58·18	58·32	58·43	58·12	57·97	58·06	......
		59·33	59·04	59·05	59·02	58·62	58·61	58·85	58·15	58·26	58·35	58·12	57·99	58·03	......
Sept. 1....	13,153 13,333	59·12	59·11	59·11	59·07	58·65	58·64	58·88	58·19	58·31	58·46	58·17	58·09	58·12	......
		59·35	59·05	59·06	59·04	58·63	58·62	58·87	58·16	58·27	58·37	58·13	58·01	58·05	......
		59·34	59·04	59·00	58·98	58·59	58·58	58·82	58·12	58·23	58·33	58·08	57·95	58·00	......
" 3....	12,531 12,687	59·16	58·87	58·88	58·84	58·42	58·41	58·64	57·97	58·11	58·17	57·96	57·85	57·92	......
		59·17	58·88	58·87	58·85	58·42	58·41	58·67	57·98	58·12	58·23	57·97	57·86	57·92	......
		59·22	58·90	58·89	58·89	58·47	58·46	58·72	58·03	58·17	58·27	57·99	57·89	57·92	......
" 5....	12,734 12,707	59·26	58·92	58·91	58·92	58·52	58·51	58·72	58·06	58·15	58·25	58·01	57·93	57·93	......
		59·23	58·92	58·93	58·91	58·52	58·51	58·70	58·05	58·13	58·22	58·00	57·90	57·91	......
		59·18	58·88	58·92	58·85	58·43	58·42	58·67	57·99	58·10	58·23	57·98	57·87	57·93	......
" 9....	13,213 13,182	59·42	59·10	59·17	59·04	58·61	58·62	58·95	58·22	58·35	58·45	58·13	58·05	58·08	......
		59·47	59·15	59·19	59·12	58·71	58·69	58·96	58·24	58·33	58·49	58·16	58·07	58·11	......
		59·47	59·16	59·23	59·16	58·72	58·70	58·57[1]	58·25	58·37	59·01[1]	58·21	58·12	58·13	......
" 20....	11,677	58·44	58·18	58·15	57·94	57·79	57·80	58·00	57·40	57·50	57·60	57·22	57·35	57·34	......
		58·43	58·19	58·15	57·95	57·80	57·81	58·02	57·38	57·51	57·59	57·31	57·22	57·30	......
" 21	11,825	58·50	58·23	58·20	58·17	57·79	57·79	58·00	57·42	57·50	57·68	57·44	57·32	57·36	
		58·55	58·34	58·27	58·27	57·90	57·88	58·05	57·51	57·61	57·70	57·49	57·39	57·43	..

Location of Gauges shown on plan of Western Outlet, dated November, 1913. Readings marked [1] are possibly in error.

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

DATE 1913	Discharge in Sec. Feet	GAUGE NUMBER													
		1	2	2A	3	4	5	6	7	8	9	10	11	12	13
Sept. 22	11,167	58·79 58·83	58·58 58·63	58·56 58·63	58·51 58·60	58·14 58·34	58·13 58·34	58·20 58·51	57·75 58·20	57·84 58·00	57·93 58·21	57·73 58·15	57·62 58·09	57·65 58·08	. .
23	8,526 8,342	58·85 58·85 58·82	58·71 58·69 58·68	58·71 58·71 58·71	58·70 58·68 58·67	58·51 58·52 58·50	58·50 58·50 58·18	58·62 58·63 58·60	58·35 58·36 58·38	58·40 58·39 58·41	58·42 58·42 58·42	58·32 58·33 58·37	58·26 58·28 58·31	58·27 58·29 58·32	..
24	7,200	58·75 58·70	58·57 58·56	58·61 58·58	58·61 58·56	58·45 58·38	58·46 58·37	58·50 58·49	58·34 58·26	58·37 58·30	58·39 58·32	58·32 58·27	58·25 58·20	58·27 58·22	
25	7,780 7,615	58·75 58·76 58·73	58·60 58·61 58·63	58·65 58·65 58·66	58·61 58·65 58·63	58·47 58·48 58·45	58·46 58·47 58·44	58·55 58·53 58·55	58·32 58·32 58·32	58·37 58·35 58·37	58·38 58·37 58·39	58·31 58·32 58·32	58·25 58·24 58·26	58·26 58·27 58·27	
26	7,502 7,584	58·82 58·77 58·72	58·69 58·63 58·58	58·74 58·70 58·61	58·61 58·56 58·49	58·53 58·48 58·42	58·52 58·47 58·41	58·62 58·57 58·52	58·38 58·34 58·28	58·43 58·39 58·33	58·48 58·43 58·37	58·40 58·36 58·29	58·32 58·29 58·23	58·30 58·26 58·20	..
27	6,331 5,812	58·84 58·85 58·86	58·75 58·78 58·80	58·79 58·83 58·87	58·81 58·77 58·84	58·63 58·71 58·72	58·62 58·68 58·71	58·70 58·76 58·78	58·48 58 62 58·73	58·48 58·63 58·70	58·53 58·68 58·68	58·50 58 68 58·65	58·43 58·66 58·63	58·39 58·62 58·60	.
28	5,827 5,835	58·86 58·82 58·78	58·82 58·72 58·71	58·86 58·80 58·73	58·83 58·77 58·70	58·73 58·66 58·57	58·73 58·66 58·58	58·78 58·71 58·64	58·63 58·57 58·51	58·67 58·60 58·54	58·67 58·60 58·54	58·64 58·57 58·50	58·60 58·50 58·45	58·60 58·52 58·44	
29	5,915 5,743	58·63 58·67 58·69	58·55 58·58 58·60	58·59 58·61 58·64	58·60 58·61 58·62	58·45 58·46 58·49	58·50 58·45 58·49	58·52 58·53 58·55	58·38 58·40 58·42	58·42 58·38 58·43	58·42 58·38 58·44	58·39 58·41 58·43	58·34 58·36 58·38	58·35 58·37 58·38	
30	5,750 5,385	58·80 58·78 58·79	58·69 58·70 58·71	58·75 58·67 58·78	58·73 58·73 58·73	58·63 58·62 58·62	58·63 58·61 58·62	58·67 58·67 58·68	58·52 58·54 58·54	58·53 58·60 58·55	58·53 58·59 58·60	58·51 58·50 58·51	58·49 58·48 58·50	58·49 58·48 58·52	.

Location of Gauges shown on plan of Western Outlet dated November, 1913.

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

Date 1913		Discharge in Sec. Ft.	GAUGE NUMBER													
			1	2	2A	3	4	5	6	7	8	9	10	11	12	13
October	1	5,564 5,170	58·73	58·65	58·68	58·67	58·54	58·51	58·60	58·17	58·49	58·49	58·48	58·43	58·42	
			58·70	58·62	58·69	58·65	58·51	58·51	58·59	58·15	58·47	58·48	58·46	58·42	58·42	
			58·71	58·64	58·65	58·63	58·51	58·51	58·58	58·43	58·48	58·48	58·43	58·40	58·43	
"	2	5,463 5,692	58·75	58·66	58·72	58·73	58·58	58·65	58·62	58·50	58·52	58·52	58·52	58·43	58·48	
			58·76	58·70	58·74	58·73	58·59	58·59	58·66	58·52	58·51	58·51	58·55	58·48	58·51	
			58·78	58·72	58·78	58·75	58·63	58·63	58·71	58·56	58·60	58·62	58·58	58·52	58·54	
"	3.	5,638 5,806	58·80	58·71	58·77	58·75	58·62	58·62	58·67	58·52	58·58	58·58	58·57	58·54	58·51	
			58·75	58·66	58·73	58·67	58·57	58·56	58·63	58·50	58·50	58·50	58·49	58·45	58·48	
			58·70	58·60	58·63	58·58	58·48	58·48	58·55	58·42	58·44	58·44	58·42	58·38	58·40	
"	4	5,419	58·62	58·52	58·57	58·58	58·45	58·47	58·50	58·38	58·40	58·40	58·38	58·34	58·35	
			58·61	58·54	58·59	58·55	58·43	58·43	58·50	58·35	58·39	58·40	58·37	58·32	58·31	
"	5	5,559	58·28	58·20	58·20	58·21	58·09	58·09	58·13	58·00	58·03	58·03	58·02	57·97	57·99	
			58·30	58·25	58·25	58·25	58·14	58·16	58·23	58·09	58·10	58·10	58·10	58·05	58·07	
"	6	5,759	58·73	58·68	58·71	58·68	58·53	58·53	58·60	58·47	58·49	58·50	58·50	58·44	58·43	
			58·73	58·68	58·71	58·68	58·56	58·56	58·62	58·52	58·51	58·52	58·49	58·44	58·45	
"	23.	5,841	58·96	58·88	58·95	58·90	58·79	58·79	58·82	58·72	58·74	58·74	58·71	58·66	58·69	34·77
"	25.	5,540	58·84	58·76	58·79	58·78	58·68	58·68	58·71	58·60	58·62	58·62	58·61	58·55	......	34·73
"	28.	5,235	58·40	58·33	58·41	58·36	58·25	58·22	58·29	58·17	58·20	58·20	58·19	58·13	58·17	34·68
"	30.	5,530	58·87	58·79	58·85	58·82	58·73	58·70	58·74	58·64	58·65	58·65	58·64	58·60	58·62	34·77
November	1.	5,515	58·96	58·91	58·92	58·94	58·84	58·82	58·85	58·72	58·75	58·78	58·76	58·71	58·73	34·79
"	4	5,540	58·94	58·88	58·92	58·93	58·82	58·82	58·85	58·73	58·74	58·78	58·79	58·72	58·74	34·68
"	6.	5,503	58·88	58·84	58·83	58·83	58·71	58·71	58·75	58·62	58·65	58·68	58·66	58·61	58·63	34·71
"	10.	5,492	58·75	58·68	58·71	58·70	58·60	58·61	58·65	58·53	58·53	58·58	58·55	58·50	58·52	34·43
"	12.	5,388	58·74	58·70	58·70	58·73	58·64	58·60	58·67	58·51	58·55	58·59	58·56	58·50	58·52	34·69
"	14.	5,651	58·86	58·80	58·78	58·82	58·70	58·70	58·74	58·61	58·62	58·67	58·65	58·60	58·62	34·74
"	17.	5,438	58·86	58·80	58·80	58·83	58·71	58·71	58·75	58·62	58·65	58·69	58·66	58·61	58·63	34·71
"	19.	5,515	58·88	58·83	58·85	58·85	58·74	58·74	58·80	58·65	58·67	58·70	58·68	58·63	58·66	34·70
"	21	5,612	58·77	58·71	58·70	58·74	58·62	58·62	58·69	58·54	58·53	58·59	58·60	58·53	58·57	34·76
"	24.	5,725	58·85	58·79	58·80	58·82	58·69	58·70	58·74	58·62	58·61	58·66	58·64	58·59	58·61	34·45
"	26	5,303	58·76	58·70	58·70	58·70	58·64	58·60	58·65	58·52	58·52	58·56	58·54	58·51	58·53	34·72
"	27	5,335	58·88	58·84	58·84	58·86	58·73	58·73	58·79	58·68	58·67	58·71	58·70	58·63	58·67	34·76
"	28.	5,527	58·79	58·73	58·73	58·76	58·65	58·64	58·64	58·58	58·58	58·64	58·64	58·53	58·57	34·69
"	29.	5,522	58·89	58·82	58·82	58·85	58·73	58·72[1]	58·79[1]	58·67	58·67	58·69	58·68	58·62	58·65	34·83
December	2.	5,239	58·84	58·77	58·78	58·80	58·68	58·73[1]	58·69[1]	58·61	58·60	58·63	58·62	58·58	58·60	34·67
"	5.	5,467	58·82	58·78	58·75	58·78	58·68	58·68[1]	58·73[1]	58·59	58·59	58·69	58·63	58·58	58·60	34·28
"	29	5,355 5,458	58·79	58·76	58·75	58·73	58·67	58·66[1]		58·56	......		58·58	58·58	58·59	34·57

Location of Gauges shown on plan of Western Outlet dated November, 1913.
Readings marked [1] are possibly in error.

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

Date 1914	Discharge in Sec. Ft.	GAUGE NUMBER													
		1	2	2A	3	4	5	6	7	8	9	10	11	12	13
January 6	5,551	58·79	58·69	58·74	58·73	58·64	58·69[1]	58·63[1]	58·55	58·52	58·63	58·57	58·60	58·55	34·78
" 9	5,272	58·85	58·78	58·70	58·79	58·70	58·70[1]	58·76[1]	58·61	58·64	58·64	58·60	58·64	58·58	34·39
" 13	5,154	..	58·71	58·70	58·71	58·63	58·65[1]	58·61[1]	58·51	58·53	58·60	58·55	58·57	58·53	34·40
" 28	5,458 5,297	58·72	58·66	58·68	58·68	58·64	58·70[1]	58·63[1]	58·55	58·59	58·61	58·56	58·55	58·50	34·42
February 4	5,461 5,390	58·86	58·79	58·78	58·79	58·70	58·70	58·75	58·60	58·61	58·65	58·62	......	58·60	34·63
" 9	5,421 5,385	58·83	58·78	58·78	58·79	58·70	58·70	58·76	58·61	58·62	58·64	58·60	58·64	58·58	34·53
" 17	5,582 5,280	58·86	58·80	58·75	58·79	58·72	58·71	58·76	58·61	58·60	58·68	58·62	58·66	58·60	34·62
" 24	6,859 7,172	58·81	58·76	58·70	58·71	58·60	58·59	58·65	58·42	58·47	58·51	58·41	58·42	58·37	35·32
" 26	8,350 8,207	58·80	58·67	58·67	58·69	58·51	58·50	58·61	58·30	58·33	58·42	58·35	58·32	58·28	35·82
March 3	8,273 7,962	58·78	58·63	58·59	58·65	58·49	58·48	58·56	58·30	58·42	58·42	58·27	58·46	58·24	35·97
" 5	7,824	58·75	58·65	58·60	58·62	58·45	58·44	58·55	58·25	58·36	58·36	58·26	58·15	58·21	36·05
" 20	7,930 8,097	58·65	58·55	58·51	58·51	58·40	58·36	58·44	58·20	58·26	58·26	58·22	58·17	58·12	36·11
" 24	7,774		...	58·51	58·51	58·36	58·37	58·41	58·15	58·22	58·28	58·17	58·10	58·13	36·02
" 27	7,954 7,640	58·62	58·54	58·49	58·51	58·37	58·37	58·44	58·14	58·22	58·27	58·17	58·11	58·13	36·04
" 31	7,652 7,837		58·53	58·50	58·50	58·37	58·38	58·42	58·14	58·24	58·25	...	......		......
April 2	7,893 7,915	58·65	58·55	58·50	58·55	58·40	58·39	58·40	58·20	58·25	58·29	58·16	.	58·13	35·97
" 9	7,979 7,762	58·65	58·58	58·52	58·54	58·44	58·39	58·45	58·18	......	58·27	58·19	......	58·16	35·89
" 15	8,111 7,407	58·57	58·49	58·46	58·40	58·32	58·32	58·44	58·15	....	58·26	58·11	58·15	58·13	35·93
" 17	7,527 6,949	58·61	58·46	58·44	58·37	58·30	58·30	58·37	58·13	58·08	58·21	58·12	58·13	58·11	35·73
" 22	7,678 8,074	58·76	58·62	58·60	58·61	58·43	58·43	58·51	58·30	58·31	58·38	58·25	58·30	58·21	36·03
" 25	8,437 8,304	58·83	58·62	58·67	58·67	58·52	58·52	58·60	58·35	58·38	58·42	58·30	58·32	58·32	35·95
" 27	8,118 8,281	58·83	58·64	58·65	58·64	58·50	58·51	58·56	58·31	58·35	58·40	58·25	58·31	58·28	35·95
" 29	8,321 8,573	58·87	58·71	58·70	58·67	58·55	58·55	58·60	58·40	58·44	58·46	58·40	58·38	58·33	36·10

Location of Gauges shown on plan of Western Outlet, dated November, 1913. Readings marked [1] are possibly in error.

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

Date 1914	Discharge in Sec. Ft.	GAUGE NUMBER													
		1	2	2A	3	4	5	6	7	8	9	10	11	12	13
May 1	8,272 8,618	......	58·79	58·72	58·76	58·61	58·61	58·70	58·42	58·45	58·51	58·39	58·42	58·38	36·11
" 9	8,929 8,751	59·20	59·04	59·06	59·05	58·89	58·88	58·96	58·65	58·70	58·77	58·63	58·66	58·63	36·60
" 15	8,873 8,936	59·32	59·19	59·14	59·13	58·98	58·99	59·10	58·77	58·80	58·88	58·73	58·75	58·73	36·67
" 19	9,208	59·24	59·22	59·19	59·18	59·00	59·03	59·13	58·80	58·83	58·92	58·77	58·80	58·77	36·70
" 23	12,112 11,963	59·49	59·31	59·21	59·26	58·96	58·96	59·16	58·63	58·71	58·79	58·56	58·57	58·56	37·55
" 27	13,113 13,526	59·59	59·31	59·29	59·23	58·91	58·91	59·10	58·55	58·56	58·65	58·45	58·33	58·37	38·10
June 5	15,217 11,991	59·77	59·41	59·34	59·35	58·90	58·90	59·18	58·35	58·18	58·62	58·26	58·25	58·23	39·22
" 12	15,749 15,545	60·00	59·60	59·58	59·59	59·10	59·11	59·42	58·51	58·48	58·75	58·37	58·35	58·35	39·67
" 19	17,045 16,993	60·05	59·65	59·58	59·60	59·05	59·05	59·40	58·35	58·45	58·61	58·19	.....	58·12	39·84
" 26	18,417 18,236	59·82	59·34	59·30	59·20	58·60	58·45	58·99	57·73	57·88	58·07	57·59	....	57·50	39·29
" 30	18,436 18,602	59·89	59·39	59·32	59·31	58·62	58·62	59·10	57·75	57·90	58·08	57·58	....	57·50	39·30
July 10	18,155 18,287	59·77	59·31	59·22	59·21	58·56	58·55	58·93	57·72	57·90	58·14	57·52	.....	57·50	40·19
" 27	17,686 17,604	59·76	59·17	59·15	59·10	58·41	58·35	58·80	57·57	57·72	57·92	57·45	....	57·34	40·03
August 8	16,396 16,507	59·52	59·01	59·00	58·85	58·30	58·09	58·60	57·40	57·45	57·75	57·30	...	57·20	39·95
" 15	16,720 16,731	......	58·84	58·75	58·73	58·06	58·05	58·54	57·30	57·42	57·63	57·18		57·02	39·80
" 21	16,399 16,110	59·14	58·59	58·67	58·53	57·91	57·92	58·24	57·18	57·28	57·44	57·05	......	56·94	39·74
September 12	11,151	59·26	59·04	58·97	59·00	58·74	58·75	58·90	58·45	58·50	58·55	58·42	58·38	58·35	39·55
" 22	10,468	......	58·75	58·70	58·72	58·50	58·48	58·55	58·22	58·28	58·32	58·19	......	58·13	37·55
" 29	10,622	59·16	58·91	58·81	58·89	58·61	58·63	58·81	58·36	58·42	58·53	58·29	.....	58·27	37·50
October 3	11,125 10,905	59·19	....	58·98	58·98	58·70	58·67	58·89	58·42	58·30	58·57	58·37	......	58·33	37·67
November 9	7,713	59·59	59·49	59·50	59·42	59·30	59·32	59·40	59·18	59·19	59·26	59·16	59·17	59·10	35·74
" 11	7,395	59·36	59·22	59·19	59·22	59·11	59·11	59·20	58·99	59·00	59·05	58·98	58·99	58·92	35·87
" 27	7,203	59·59	59·34	59·32	59·35	59·24	59·24	59·31	59·12	58·88	59·19	59·10	59·12	59·10	35·90
December 12	7,517	59·46	59·40	59·39	59·15	59·31	59·30	59·38	59·20	59·22	59·28	59·15		59·11	35·70
" 29	7,375 7,339	59·50	59·42	59·37	59·33	59·26	59·28	59·35	59·07	59·15	59·19	59·13	.	59·10	35·75

Location of Gauges shown on plan of Western Outlet, dated November, 1913. Readings marked [1] are possibly in error.

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

Date 1915	Discharge in Sec. Ft.	GAUGE NUMBER													
		1	2	2A	3	4	5	6	7	8	9	10	11	12	13
January 8	7,535 7,501	59·53	59·44	59·40	59·35	59·29	59·29	59·35	59·12	59·18	59·20	59·14	......	59·11	35·85
" 14	7,665	59·53	59·46	59·41	59·40	59·30	59·29	59·38	59·17	59·17	59·23	59·15	59·14	59·09	35·97
" 22	7,713 7,688	59·53	59·46	59·41	59·38	59·30	59·34	59·39	59·18	59·19	59·22	59·16	59·14	59·11	36·03
February 6	7,434	59·55	59·48	59·43	59·41	59·31	59·33	59·40	59·19	59·20	59·23	59·16	59·15	59·12	36·03
" 16	7,725 7,621	59·52	59·45	59·41	59·38	59·28	59·31	59·38	59·16	59·19	59·25	59·16	59·22	59·11	36·00
March 9	7,418 7,578	59·47	59·41	59·36	59·32	59·23	59·25	59·33	59·10	59·15	59·18	59·10	......	59·06	35·85
" 18	7,379 7,471	59·39	59·27	59·29	59·24	59·16	59·17	59·25	59·07	59·09	59·09	59·02	......	59·00	35·48
April 6	7,459 7,768	59·50	59·43	59·40	59·36	59·26	59·28	59·35	59·13	59·10	59·21	59·13	......	59·03	35·40
" 10	13,824 13,128	59·51	59·25	59·19	59·15	58·80	58·82	59·05	58·45	58·47	58·63	58·25	......	58·27	37·45
" 22	13,025 13,258	......	59·16	59·11	59·08	58·76	58·72	59·01	58·30	58·45	58·50	58·27	......	58·25	38·25
May 11	14,028 13,300	......	59·50	59·42	59·37	59·02	59·05	59·28	59·59	58·70	58·87	58·51	......	58·50	38·40
" 18	17,660 17,907 19,226	59·94	59·32	59·24	59·14	58·50	58·60	58·90	57·72	57·80	58·10	57·55	57·45	57·55	39·10
		59·94	59·30	59·21	......	......	......	......	......	......	......	......	......	......	......
		59·94	59·30	59·13	59·10	58·53	58·55	58·91	57·66	57·95	58·00	57·48	57·41	57·45	39·15
		59·94	59·25	59·10	59·05	58·35	58·20	57·80	57·28	57·55	57·80	57·15	57·05	57·23	39·33
		59·95	59·24	59·10	59·05	58·38	58·23	57·78	57·37	57·50	57·80	57·18	57·08	57·14	39·40
" 19	20,863 20,907	......	......	59·02	58·98	58·10	57·95	58·60	56·91	57·00	57·25	56·68	56·52	56·45	39·80
		......	......	59·01	58·91	58·02	57·80	58·55	......	......	57·25	......	56·32	......	......
		59·97	59·11	58·99	58·93	57·99	57·79	58·55	56·68	56·90	57·20	56·37	56·21	56·30	40·05
" 20	22,804	......	58·98	58·87	58·82	57·75	57·35	58·35	56·07	56·30	55·67	55·76	55·62	55·81	40·40
		......	......	58·87	58·80	57·80	57·30	58·31	56·00	56·30	56·57	......	......	......	......
" 21	22,481 21,778 21,554	59·94	58·95	58·83	58·77	57·70	57·30	58·24	55·95	56·11	56·48	55·70	55·42	55·60	40·75
		59·94	59·00	58·84	58·75	57·72	57·27	58·25	56·00	56·45	56·80	56·00	55·85	56·02	40·70
		......	59·00	58·86	58·87	57·85	57·58	58·35	56·37	......	......	......	......	......	......
		59·89	59·00	58·86	58·85	57·87	57·55	58·35	56·40	56·50	56·85	56·25	56·05	56·15	40·60
" 31	17,325 17,833	59·71	59·23	59·20	59·17	58·53	58·55	59·88	57·75	57·90	58·07	57·61	57·48	57·52	39·79
June 7	17,435 17,397	59·62	59·11	59·07	59·03	58·41	58·35	58·79	57·64	57·75	58·01	57·51	57·41	57·45	39·59
" 25	18,659 18,706	60·15	59·56	59·47	59·41	58·82	58·80	59·84	57·97	58·13	58·23	57·79	57·70	57·73	40·19
" 30	22,340	60·34	59·61	59·50	59·48	58·65	58·53	59·09	57·14	56·47	57·82	56·91	56·74	56·78	40·94

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

Date 1915	Discharge in Sec. Ft.	GAUGE NUMBER													
		1	2	2A	3	4	5	6	7	8	9	10	11	12	13
July 5..	23,323 23,427	60·39	59·71	59·67	59·61	58·60	58·58	59·30	57·24	57·60	57·92	56·95	56·85	56·83	41·24
" 12..	23,111 23,733	60·35	59·78	59·71	59·69	58·74	58·63	59·39	57·36	57·75	57·84	57·13	56·94	56·96	41·49
" 16..	23,488 23,345	60·41	59·79	59·67	59·68	58·75	58·58	59·35	57·29	57·67	57·94	57·13	56·93	57·01	41·49
" 22..	22,845 22,794	60·34	59·67	59·60	59·53	58·65	58·48	59·16	57·19	57·55	57·92	57·02	56·88	56·92	41·44
" 28..	24,478 24,681	60·14	59·37	59·27	59·21	58·12	57·68	58·78	56·34	56·64	57·92	56·00	55·78	55·80	41·74
August 2..	23,716 23,597	59·93	59·16	58·98	58·95	57·90	57·48	58·45	56·11	56·45	56·72	55·81	55·59	55·62	41·60
" 5.	23,379 23,317	59·85	59·08	58·94	58·91	57·80	57·51	58·44	55·99	56·43	56·70	55·77	55·55	55·59	41·70
" 11..	21,142	59·85	59·16	59·05	59·02	58·10	57·83	58·59	56·71	57·00	57·32	56·55	56·38	56·48	41·15
" 16..	21,567 21,576	59·47	58·79	58·61	58·54	57·57	57·38	58·08	56·25	56·42	56·77	55·95	55·80	55·83	40·90
" 27	11,492 11,119	59·60	59·30	59·29	59·25	59·05	59·06	59·17	58·77	58·84	58·93	58·70	58·70	58·63	37·70
" 30.	11,052 11,168	59·50	59·28	59·30	59·20	59·02	59·01	59·14	58·72	58·80	58·87	58·68	58·64	58·48	37·20
September 3	10,760 10,811	59·38	59·07	59·08	59·02	58·82	58·81	58·95	58·51	58·62	58·66	58·50	58·47	58·43	37·15
" 8	10,824 11,027	59·40	59·09	59·11	59·02	58·81	58·77	58·89	58·53	58·63	58·72	58·53	58·48	58·44	37·20
" 13	10,339 10,409	59·08	58·89	58·85	58·83	58·65	58·61	58·75	58·39	8·45	58·52	58·36	58·33	58·28	36·90
" 17	10,314	59·15	59·06	58·98	59·04	58·81	58·80	58·91	58·54	58·63	58·72	58·54	58·56	58·45	37·10
" 22.	10,767 10,411	59·18	59·01	58·98	58·95	58·81	58·83	58·89	58·52	58·62	58·72	58·53	58·48	58·43	37·05
" 27	10,005	59·02	58·90	58·84	58·84	58·66	58·62	58·75	58·51	58·47	58·53	58·38	58·36	58·33	36·90
October 1	7,148 7,128	59·08	58·96	58·94	58·91	58·82	58·80	58·87	58·71	58·75	58·79	58·70	58·69	58·66	36·45
" 4..	6,746 6,805	58·68	58·62	58·57	58·56	58·49	58·48	58·54	58·38	58·45	58·50	58·39	58·38	58·36	35·87
" 8..	7,218 6,957	58·79	58·79	58·67	58·72	58·66	58·66	58·70	58·54	58·60	58·62	58·55	58·54	58·51	35·95
" 13.	7,074 7,246	59·60	58·87	58·86	58·82	58·76	58·73	58·78	58·61	58·69	58·71	58·63	58·63	58·58	35·87
" 18	7,099 7,289	59·05	58·96	58·92	58·89	58·81	58·80	58·85	58·70	58·75	58·82	58·70	58·68	58·65	35·70

TABLE OF DISCHARGES AND SLOPE GAUGE READINGS AT WESTERN OUTLET, LAKE OF THE WOODS—Continued.

Date 1915		Discharge in Sec. Ft.	GAUGE NUMBER													
			1	2	2A	3	4	5	6	7	8	9	10	11	12	13
October	22	6,967 7,061	58·95	58·75	58·74	58·80	58·62	58·62	58·65	58·51	58·55	58·60	58·52	58·50	58·47	35·77
"	27	7,598 7,170	59·20	59·04	59·24	59·00	58·91	58·90	58·96	58·79	58·85	58·90	58·79	58·77	58·75	35·90
November	3	6,932 6,988	58·95	58·86	58·80	58·82	58·74	58·72	58·77	58·61	58·67	58·72	58·64	58·62	58·59	35·80
"	10	7,120 7,221	59·20	59·06	59·04	58·97	58·91	58·91	58·97	58·79	58·85	58·91	58·78	58·79	58·78	35·85
"	13	6,698 6,798	58·90	58·87	58·82	58·83	58·77	58·75	58·79	58·64	58·68	58·74	58·65	58·64	58·61	35·85
"	15	6,689 6,939	58·95	58·85	58·79	58·82	58·71	58·71	58·76	58·60	58·67	58·71	58·61	58·60	58·56	35·85
"	22	6,689 6,789	58·82	58·80	58·79	58·74	58·69	58·72	58·71	58·59	58·52	58·65	58·58	58·57	58·54	35·80
"	26	6,936 6,886	58·94	58·81	58·78	58·80	58·71	58·71	58·75	58·61	58·65	58·70	58·60	58·60	58·57	35·82
December	1	6,660 6,586	58·94	58·83	58·78	58·78	58·70	58·70	58·76	58·59	58·57	58·72	58·61	58·59	58·56	35·82
"	6	6,630 6,630	58·95	58·83	58·77	58·79	58·69	58·69	58·75	58·59	58·64	58·70	58·60	......	58·56	35·55
"	10	6,625 6,625	58·93	58·81	58·78	58·73	58·70	58·68	58·76	58·59	58·65	58·67	58·60	58·52	58·56	35·73
"	15	6,812 6,830	58·90	58·81	58·77	58·75	58·69	58·68	58·72	58·58	58·64	58·77	58·59	58·51	58·56	35·82
"	21	6,931	59·00	58·87	58·84	58·79	58·75	58·71	58·70	58·62	58·71	58·72	58·65	58·57	58·61	35·85
"	24	6,857 6,835	59·00	58·90	58·86	58·82	58·79	58·79	58·82	58·67	58·72	58·73	58·67	58·60	58·63	35·75
"	28	6,743 6,694	59·00	58·87	58·85	58·84	58·78	58·76	58·79	58·66	58·67	58·72	58·65	58·60	58·61	35·75

PROGRESS REPORT
OF THE
MANITOBA HYDROMETRIC SURVEY
FOR
THE CALENDAR YEAR, 1915

PART IV.
METEOROLOGICAL DATA

METEOROLOGICAL DATA

Report on Meteorological Station, Winnipeg Beach.

May 1915	Time	Evaporation	Time	Evaporation	Rain
1					
2					
3					
4					
5			[1]9.00p.m.		
6			5.25 "	0·055	
7	7.50 a.m.	0·015	4.55 "	0·025	
8	9.35 "	0·050	5·15 "	0·030	
9	10.30 "	0·050	6.25 "	0·100	
10	8.20 "	0·070	4.35 "	0·070	
11	8.35 "	0·045	4.23 "	0·075	
12	8.25 "	0·060	6·30 "	0·055	0·12
13	8.55 "	0·045	5.05 "	0·075	
14	8.35 "	0·065	4.25 "	0·065	
15	8.30 "	0·155	4.40 "	0·100	
16	10.25 "	0·165	4.35 "	0·100	
17	8.40 "	0·075	5.05 "	0·070	Snow
18	8.43 "	0·025	4.30 "	0·045	
19	8.50 "	0·185	4.35 "	0·130	
20	7.50 "	0·100	4·35 "	0·105	
21	8·10 "	0·105	4.35 "	0·060	
22	9·00 "	0·175	3.52 "	0·070	
23	9.30 "	0·280			

---

[1] Tank Set.

Report on Meteorological Station, Winnipeg Beach.

June 1915	Time	Evaporation	Time	Evaporation	Rain
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12	9.30 a.m.	0·100	7.15 p.m.	0·100	
13	9.30 "	0·090	6.30 "	Rain Gauge broken	0·147[1]
14	9.30 "	Rain Gauge broken	6.30 "	0·200	0·158[1]
15	9.30 "	0·060	6.30 "	0·100	
16	9.30 "	0·100	6.30 "	0·100	0·220
17	9·30 "	0·020	6.30 "	0·060	0·190
18	9.30 "	0·120	6.30 "	0·050	
19	9.30 "	0·060	6.30 "	0·080	
20	9·30 "	0·120	6.30 "	0·020	0·070
21	9·30 "	0·020	6.30 "	0·110	0·030
22	9·30 "	0·110	6.30 "	0·090	
23	9.30 "	0·100	6.30 "	0·060	0·150
24	9.30 "	0·090	6.30 "	0·060	0·170
25	9.30 "	0·090	6.30 "	0·040	0·290
26	9.30 "	0·090	6.30 "		
27	9.30 "	0·060	6.30 "	0·120	
28	9.30 "	0·200	6.30 "	0·080	0·100
29	9.30 "	0·020	6.30 "	0·160	
30	9.30 "	0·120	6.30 "	0·080	0·200

---

[1] Computed.

REPORT ON METEOROLOGICAL STATION, WINNIPEG BEACH.

July 1915	Time	Evaporation	Time	Evaporation	Rain
1	9.30 a.m.	0·040	6.30 p.m.	0.160	0·050
2	9.30 "	0·030			0·030
3					[1]0·120
4					
5					
6					
7					
8					
9					
10					
11					0·065
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28	9.30 a.m.		6.30 p.m.	0·080	
29	9.30 "	0·100	6.30 "	0·070	
30	9.30 "	0·060	6.30 "	0·080	
31	9.30 "	0·010	6.30 "	0·020	

[1] Pin of Evaporation tank broken.

REPORT ON METEOROLOGICAL STATION, WINNIPEG BEACH.

August 1915	Time	Evaporation	Time	Evaporation	Rain
1	9.30 a.m.	0·040	6.30 p.m.	0·060	·11
2	9.30 "	0·200	6.30 "	0·400	
3	9.30 "	0·080	6.30 "	0·200	
4	9.30 "	0·070	6.30 "	0·200	
5	9.30 "	0·100	6.30 "	0·080	
6	9.30 "	0·160	6.30 "	0·100	
7	9.30 "	0·080	6.30 "	0·080	
8	9.30 "	0·060	6.30 "	0·100	
9	9.30 "	0·060	6.30 "	0·040	
10	9.30 "	0·060	6.30 "	0·140	
11	9.30 "	0·080	6.30 "	0·180	
12	9.30 "	0·100	6.30 "	0·080	
13	9·30 "	0.060	6.30 "	0.150	
14	9.30 "	0·050	6.30 "	0·100	
15	9.30 "	0·090	6.30 "	0·160	
16	9.30 "	0·090	6.30 "	0·150	
17	9.30 "	0·100	6.30 "	0·100	
18	9.30 "	0·080	6.30 "	0·150	
19	9.30 "	0·060	6.30 "	0·120	
20	9.30 "	0·100	6.30 "	0·090	·22
21	9.30 "	0·060	6.30 "	0·090	
22	9.30 "	0·060	6.30 "	0·080	
23	9.30 "	0·120	6.30 "	0·150	
24	9.30 "	0·100	6.30 "	0·150	
25	9.30 "	0·100	6.30 "	0·160	
26	9.30 "	0·080	6.30 "	0·120	
27	9.30 "	0·040	6.30 "	0·180	
28	9.30 "	0.080	6.30 "	0·090	·40
29	9.30 "	0·100	6.30 "	0·060	
30	9.30 "	0·040	6.30 "	0·060	
31	9.30 "	0·040	6.30 "	0·090	

REPORT ON METEOROLOGICAL STATION, WINNIPEG BEACH.

Sept. 1915	Time	Evaporation	Time	Evaporation	Rain
1	9.30 a.m.	0·100	6.30 p.m.	0·080	....
2	9.30 "	0·040	6.30 "	0·060	·17
3	9.30 "	0·030	6.30 "	0·040	....
4	9.30 "	0·040	6.30 "	0·100	....
5	9.30 "	0·050	6.30 "	0·120	....
6	9.30 "	0·020	6.30 "	0·100	·35
7	9.30 "	....	....	....	a.m. ·33 p.m. 1.50
8	9.30 "	....	6.30 "	0·020	1·40
9	9.30 "	0·040	6.30 "	0·100	....
10	9.30 "	0·080	6.30 "	0·090	·25
11	9.30 "	0·060	6.30 "	0·100	·40

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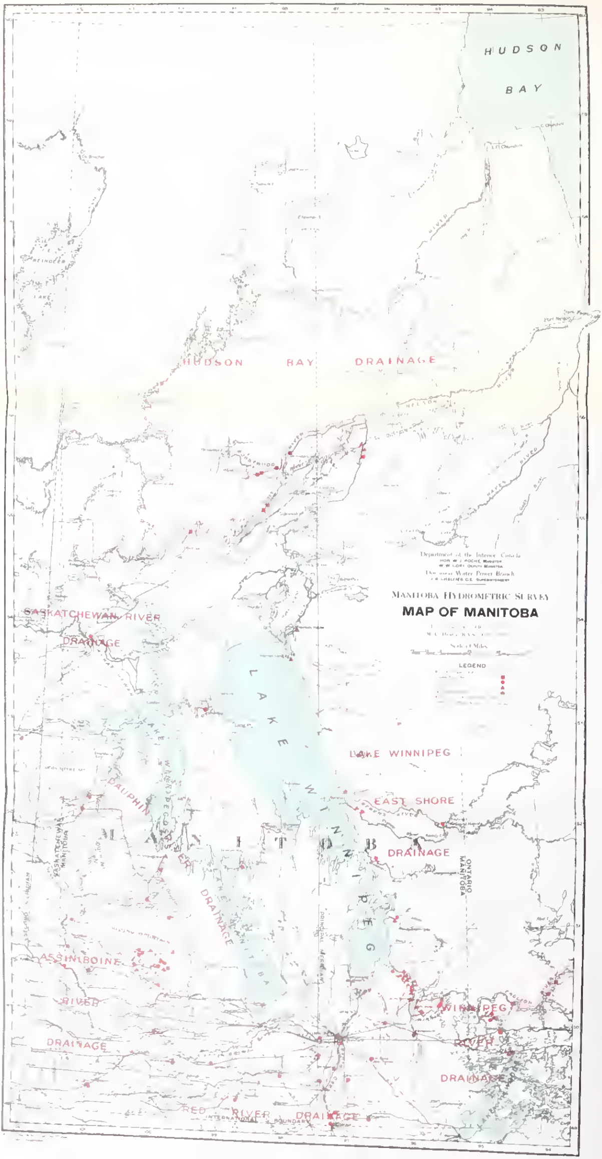

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